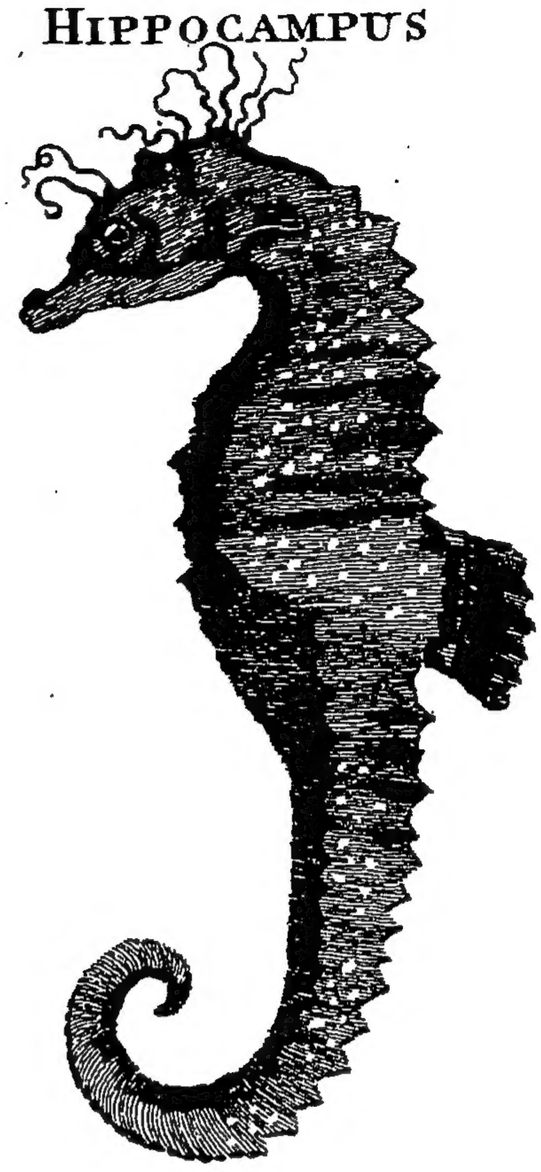
FISHES.

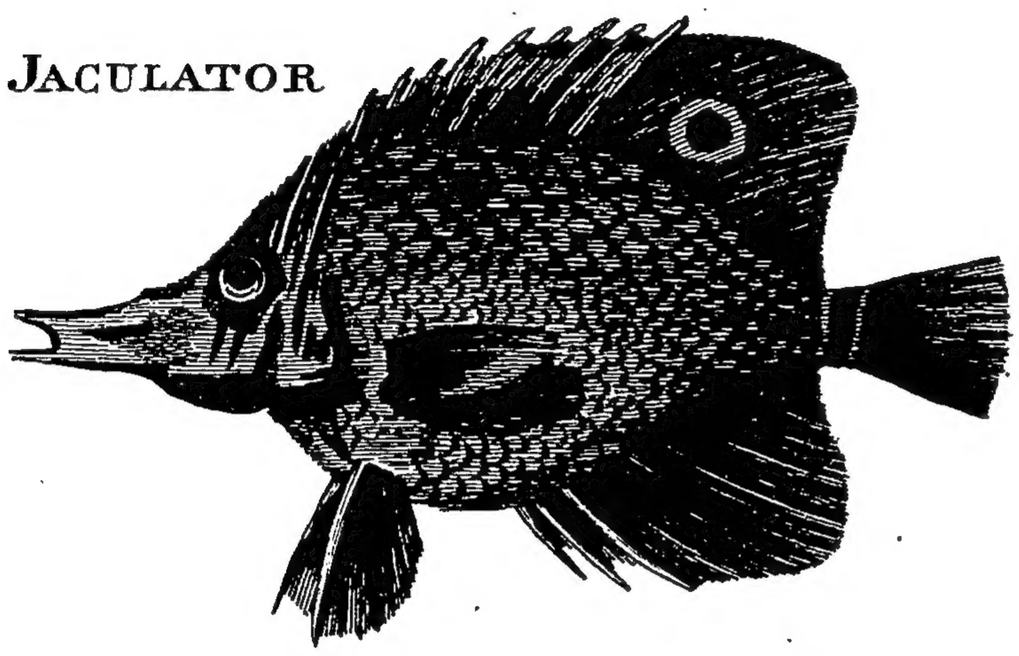
GYMNOTUS ELECTRICUS

HUSO GERMANORUM

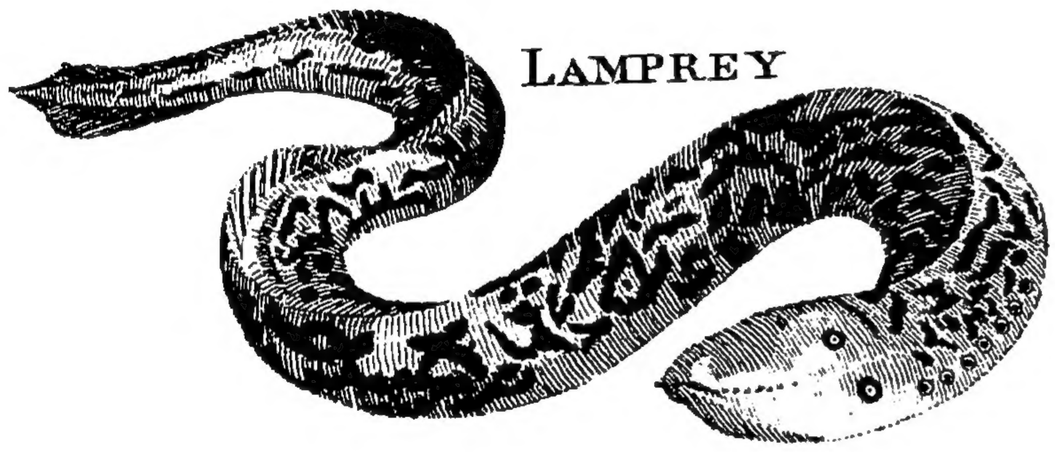
HIPPOCAMPUS



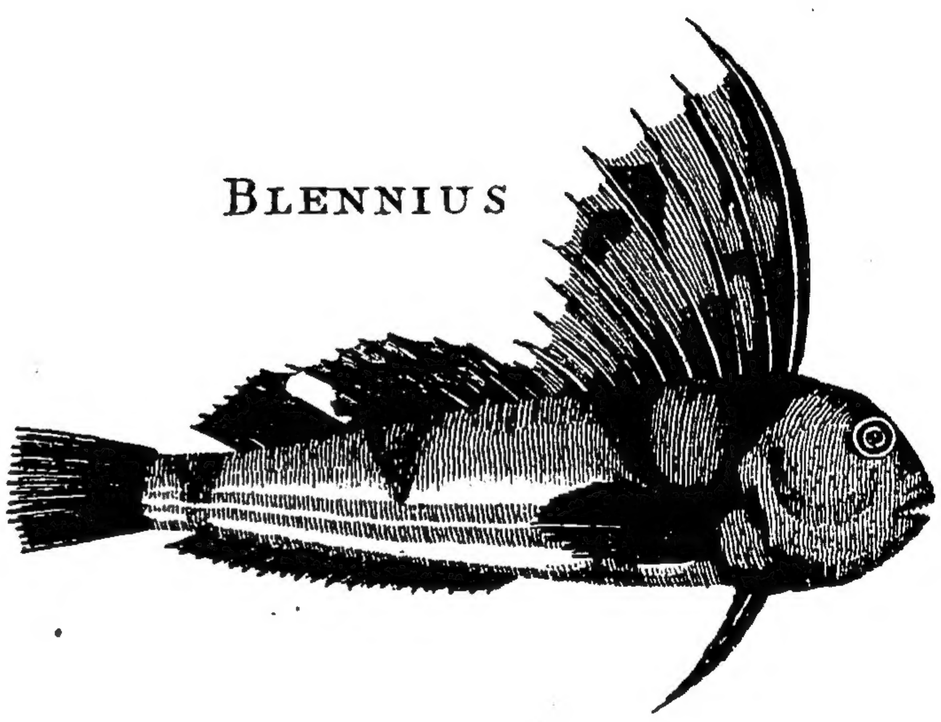
JACULATOR



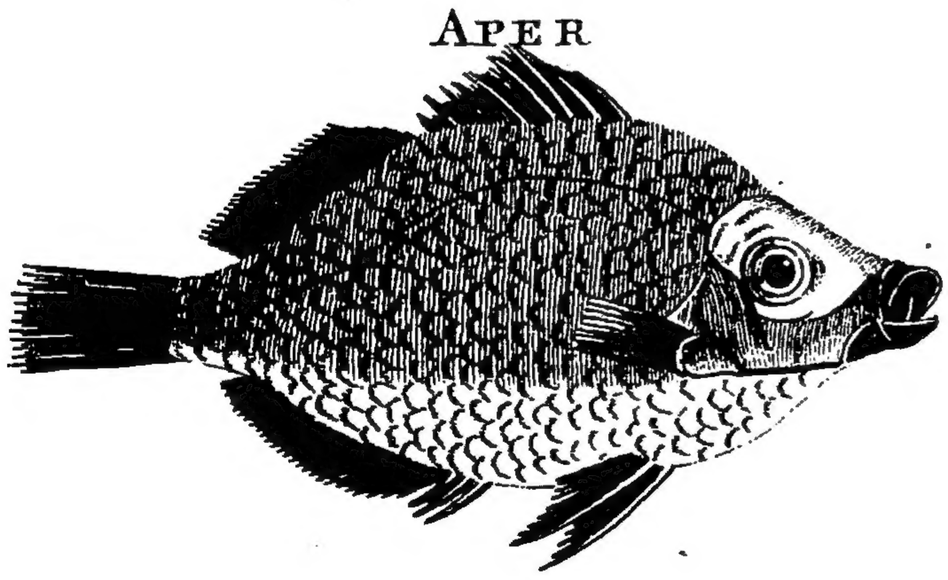
LAMPREY



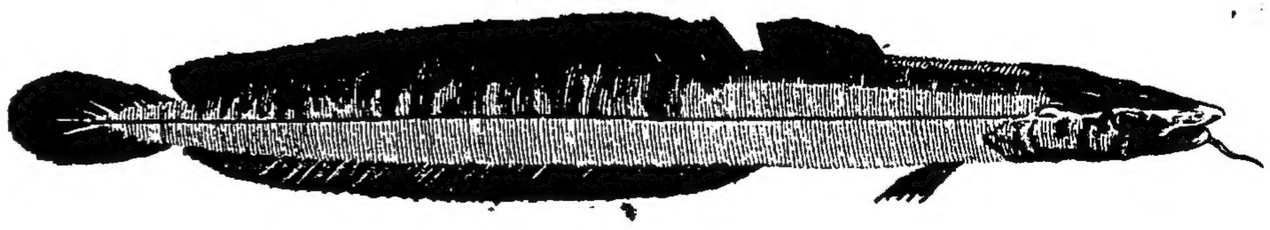
BLENNIUS



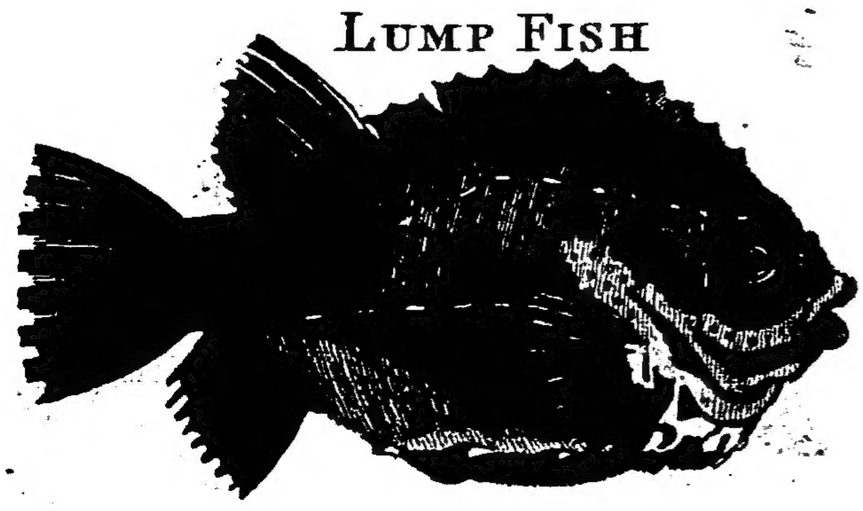
APER



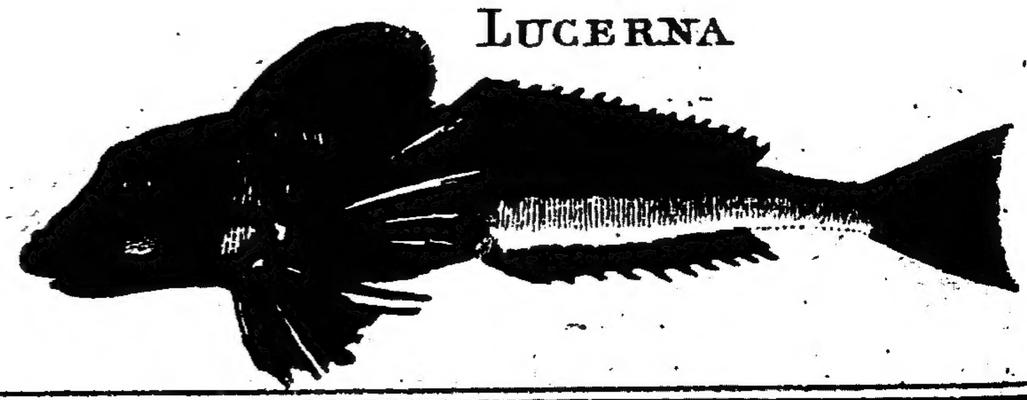
LING



LUMP FISH



LUCERNA

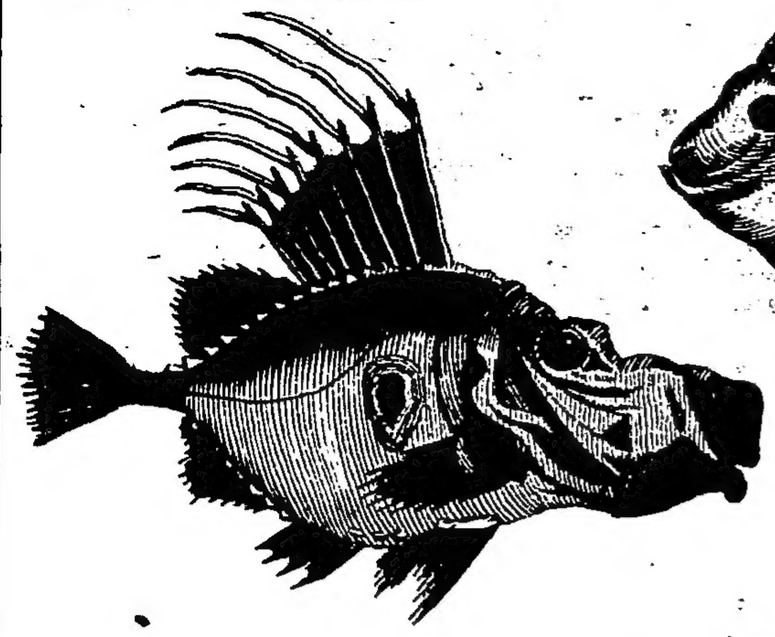


Published by Alex.r Hogg at the Kings Arms N.o 16 Paternoster Row.

Taylor sculp.

FISHES

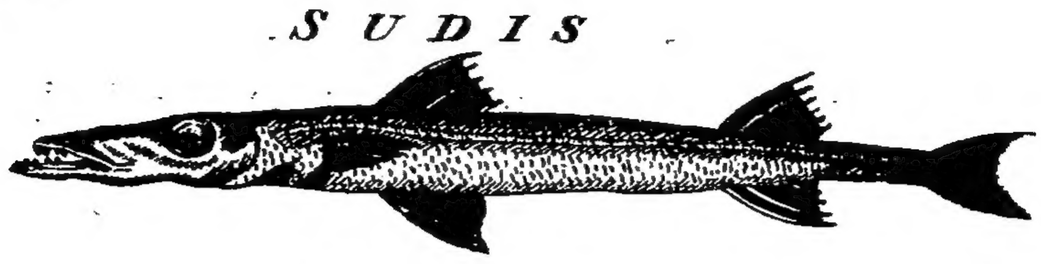
The DOREE



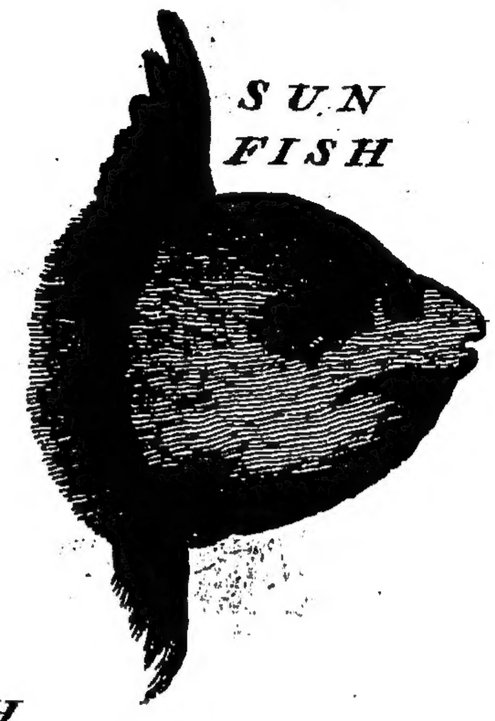
ABACATUAIA

A STURGEON

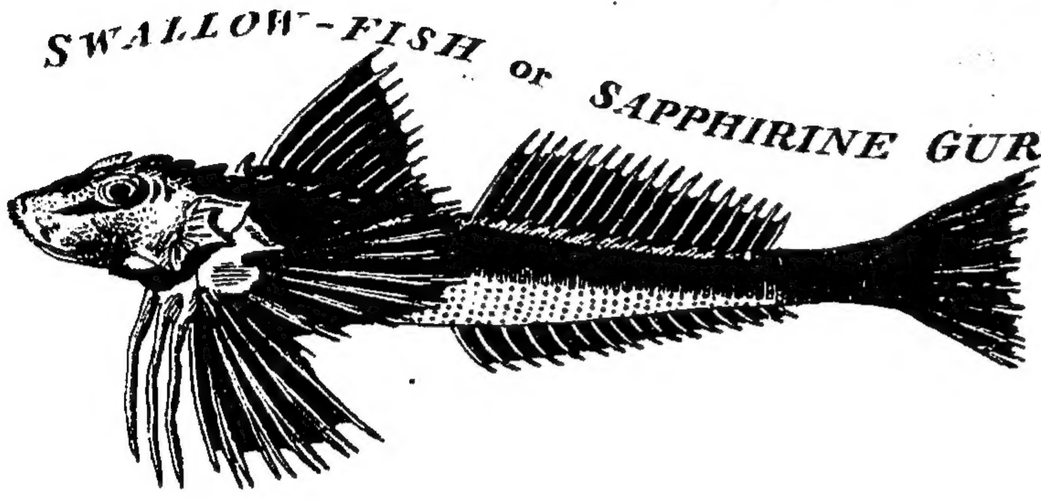
SUDIS



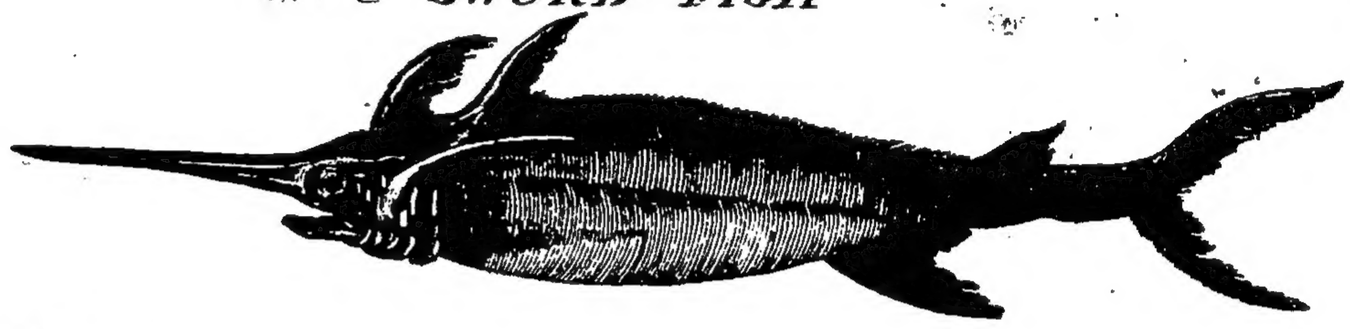
SUN FISH



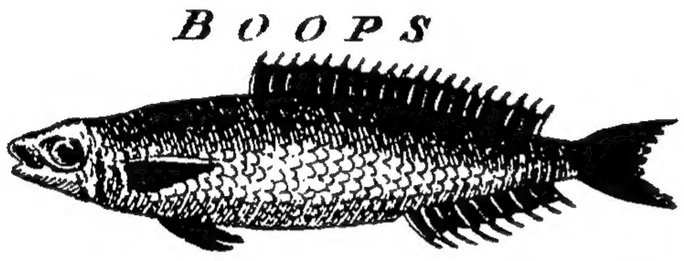
SWALLOW-FISH or SAPPHIRINE GURNARD



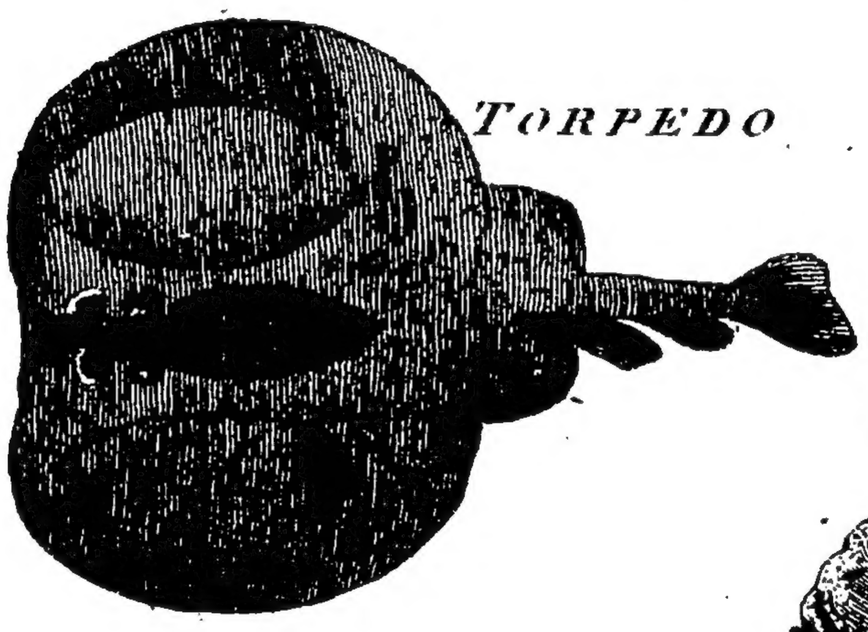
A SWORD-FISH



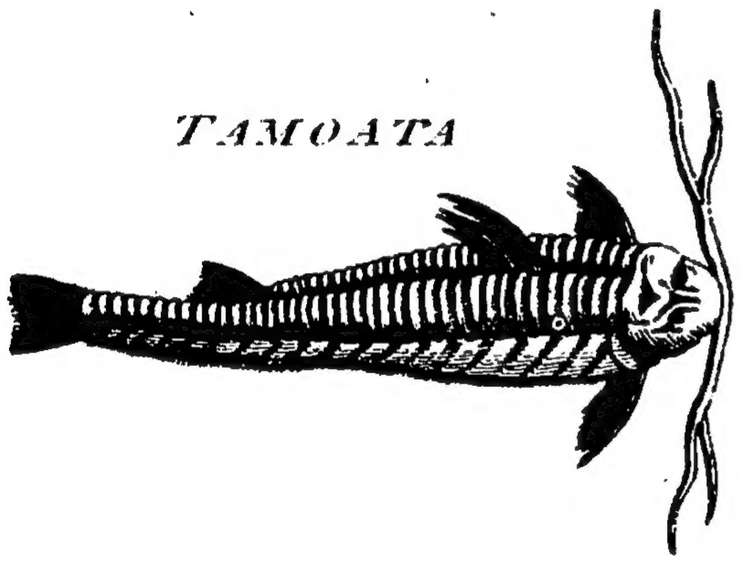
BOOPS



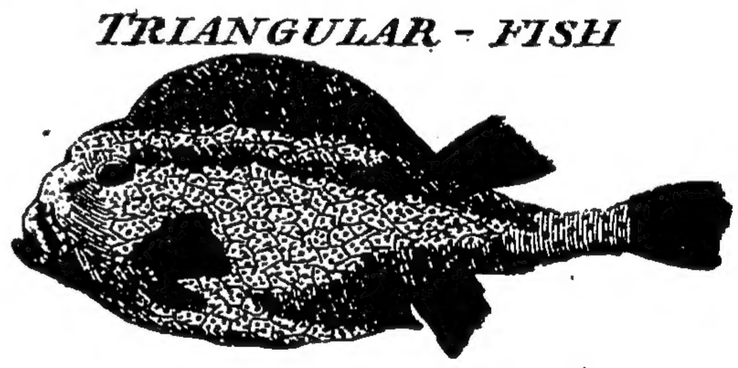
TORPEDO



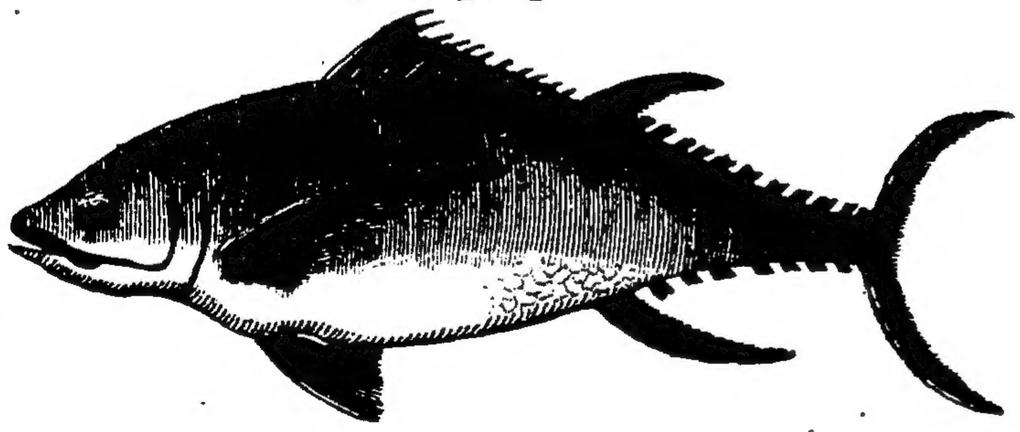
TAMOATA



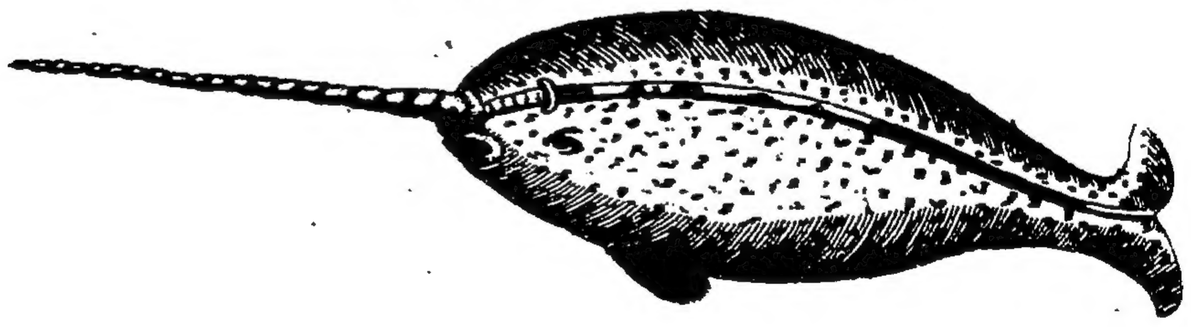
TRIANGULAR-FISH



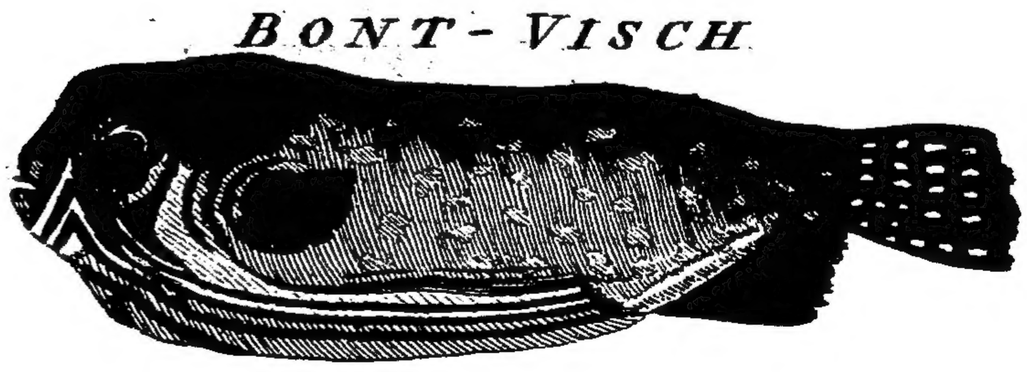
TUNNY



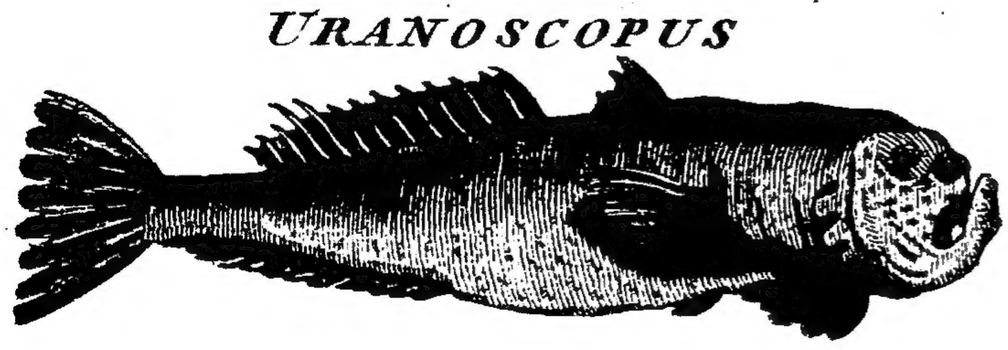
SEA UNICORN



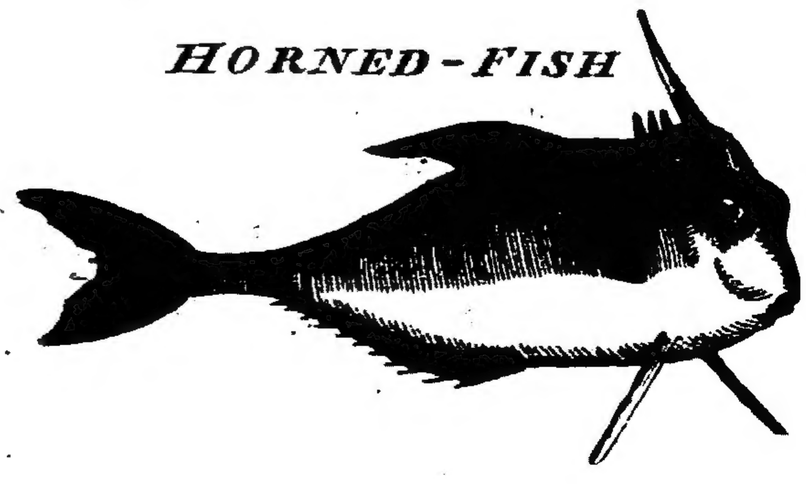
BONT-VISCH



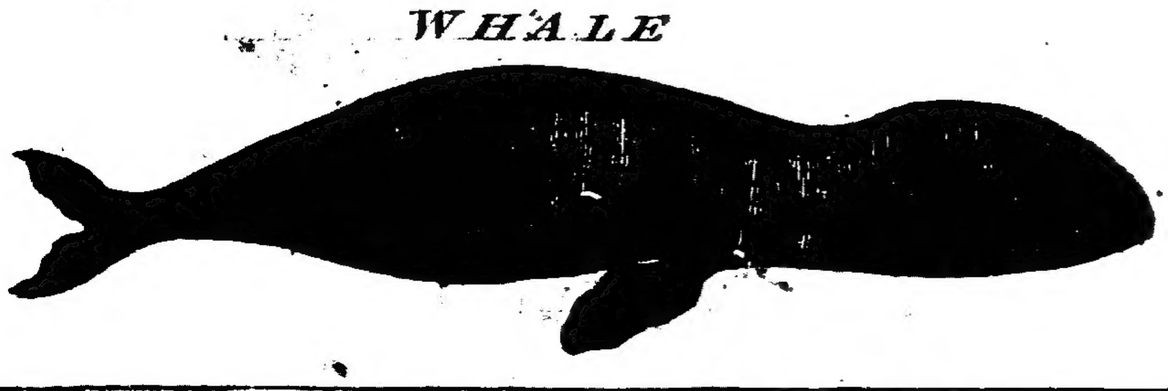
URANOSCOPUS



HORNED-FISH



WHALE



Published as the Act directs, by Harr.t Hogg, N.o 16, Pinternoster Row.

Eastgate sculp.

or even with a ſtick, it inſtantly benumbs the hand and arm to the very ſhoulder.

Captain Johnſon being at Caſſan, a ſailor caught one of theſe fiſh, which he ſuppoſed to be a bream; but the very inſtant that he touched it, he cried out that he had loſt the uſe of his hand. His companions laughed at him, and one of them immediately trod upon it with his naked foot, when his whole leg became ſuddenly motionleſs: the cook was then called, and ordered to take the fiſh and dreſs it; but he immediately let it fall, and, in a mournful tone, declared he was ſeized with the palſy. At length a negro, who was preſent, ſaid he was acquainted with the fiſh, and aſſured them that, after it was dead, it would loſe the numbing quality.

The following experiment, made by Mr. Walſh, in preſence of the academy at Rochelle, for evincing the circuit of the electric matter which iſſues from the Torpedo, deſerves to be quoted.

"A living Torpedo was laid on a table, upon a wet napkin; round another table ſtood five perſons inſulated; and two braſs wires, each thirteen feet long, were ſuſpended from the ceiling by ſilken ſtrings. One of the wires reſted by one end on the wet napkin, the other end was immerſed in a baſon full of water, placed on a ſecond table, on which ſtood four other baſons, likewiſe full of water. The firſt perſon put a finger of one hand into the water in which the wire was immerſed, and a finger of the other hand into the ſecond, and ſo on ſucceſſively till all the five perſons communicated with one another by the water in the baſons. In the laſt baſon one end of the ſecond wire was dipped, and with the other end Mr. Walſh touched the back of the Torpedo; when the five perſons felt a ſhock, differing in nothing from that of the Leyden experiment, except being weaker. Mr. Walſh, who was not in the circle of conduction, felt nothing. This was ſeveral times ſucceſſively repeated, even with eight perſons; and the experiment being related by M. de Signette, mayor of the city, and one of the ſecretaries to the academy of ſciences of Rochelle, and publiſhed by him in the French Gazette, the account becomes the more authenticated."

The diſcourſe ends with the following addreſs to Mr. Walſh, on preſenting him with the medal.

"In conſequence of the approbation of the choice made by the council, ſo unfeignedly expreſſed in the countenance of every gentleman preſent, it remains, that in the name, and by the authority, of the Royal Society in London, formed for the improvement of natural knowledge, I deliver into your hand this medal, the prize you have ſo meritoriouſly obtained; not doubting, Sir, of your grateful acceptance of ſo honourable and unperiſhing a memorial of their eſteem, and of the ſenſe of their obligations to a perſon, who in ſo diſtinguiſhed a manner has contributed to promote the great ends of their inſtitution. And, in the ſame reſpectable name, let me add, that they are ſo much perſuaded of your abilities to aſſiſt in their grand work, the *interpretation of nature*, that they earneſtly call upon you to continue your liberal and ſpirited labours. With pleaſure they underſtand that you have already turned your views to the electric gymnotus, that other wonder of the waters, an animal poſſeſſed of powers ſimilar to thoſe of the Torpedo, but of ſuperior energy; and the ſociety flatter themſelves, that ſo much light will be gained by that enquiry, that you will be enabled ſoon to make a farther diſcovery of the myſteries of nature. Her veil, fear not, Sir, to approach. Animated with the preſence of this illuſtrious and ſucceſsful body, I will venture to affirm, that nature has no veil, but what time and perſevering experiments may remove. In the inſtance before us, view the progreſs of the powers of the mind; view the philoſophers of the early ages, like the "children of the world," amuſed and ſatisfied with the ſtories of the Torpedo, as incurious about their authenticity, as about the cauſes of ſuch extraordinary effects. This animal ſerved them for an emblem, or an hieroglyphic, for a figure of ſpeech, or an alluſion of pleaſantry: at beſt as a theme for a copy of verſes. But the world, riſing in years and in wiſdom, rejects ſuch trifles. The interpreters of nature, in the adult ſtate of time, make experiments and inductions, diſtruſt their intellects, confide in facts and in their ſenſes: and by theſe arts drawing aſide the veil of nature, find a mean and groveling animal armed with lightning; that awful and celeſtial fire revered by the antients as the peculiar attribute of the father of their gods."

The following is a curious account of the Gymnotus Electricus, or electrical Eel. In a Letter from Alexander Garden, M. D. F. R. S. to John Ellis, Eſq; F. R. S. read before the Royal Society the 23d of February, 1775.

"*Charles-Town, South-Carolina.*
Auguſt 14, 1774.

"Sir,

"A few days ſince I went to ſee ſome very curious fiſh, which were brought here about nine or ten weeks ago from Surinam; and I was both ſurprized and delighted to obſerve their ſtrange ſhape, and experience their wonderful properties. I had before received ſome vague account of ſuch a fiſh; but I always thought, that much of what I always heard was fabulous. There are five of theſe fiſhes now here, of different ſizes, from two feet in length, to three feet eight inches. The following deſcription was made out from the longeſt and largeſt. It might have been much more accurate, if there had been a poſſibility of handling the fiſh, and examining it leiſurely; or if I could have had a dead ſpecimen, as many things relating to the internal and external ſtructure could in that caſe have been more exactly aſcertained. But this fiſh hath the amazing power of giving ſo ſudden and ſo violent a ſhock to any perſon that touches it, that there is, I think, an abſolute impoſſibility of ever examining, accurately, a living ſpecimen, and the perſon who owns them, rates them at too high a price (not leſs than fifty guineas for the ſmalleſt) for me to get a dead ſpecimen, unleſs one ſhould die by accident; if that ſhould happen, you may depend on having a more exact and accurate account for the Society.

"George Baker, mariner, who brought them here, intends to carry them to England; but as it is very uncertain whether they will arrive in health, and all alive, I have recommended to him to get a ſmall caſk of rum, with a large bung, into which he may put any of them that may die, and ſo prepare them for the inſpection and examination of the curious when he arrives.

"The largeſt of theſe fiſh was three feet eight inches in length, when extending itſelf moſt, and might have been from ten to fourteen inches in circumference about the thickeſt part of the body. The head is large, broad, flat, ſmooth, and impreſſed here and there with holes, as if perforated with a blunt needle, eſpecially towards the ſides, where they are more regularly ranged in a line on each ſide. The roſtrum is obtuſe and rounded. The upper and lower jaws are of an equal length, and the gape is large. The noſtrils are two on each ſide; the firſt large, tubular, and elevated above the ſurface: and the others ſmall, and level with the ſkin, placed immediately behind the verge of the roſtrum, at the diſtance of an inch aſunder. The eyes are ſmall, flattiſh, and of a bluiſh colour, placed about three quarters of an inch behind the noſtrils, and towards the ſides of the head. The

whole head ſeems to be well ſupported; but whether with bones or cartilages, I could not learn. The body is large, thick, and roundiſh, for a conſiderable diſtance from the head, and then gradually grows ſmaller, but at the ſame time deeper, or becomes of an acinaci-form ſhape to the point of the tail, which is rather blunt. There are many light coloured ſpots on the back and ſides of the belly, placed at conſiderable diſtances in irregular lines, but more numerous and diſtinct towards the tail. When the fiſh was ſwimming, it meaſured ſixteen inches in depth near the middle, from the upper part of the back to the lower edge of the fin, and it could not be more than two inches broad on the back at that place. The whole body, from about four inches below the head, ſeems to be clearly diſtinguiſhed into four different longitudinal parts or diviſions. The upper part, or back, is roundiſh, of a dark colour, and ſeparated from the other parts on each ſide by the lateral lines, which, taking their riſe at the baſe of the head, juſt above the pectoral fins, run down the ſides, gradually converging as the fiſh grows ſmaller, to the tail, and makes ſo viſible a depreſſion or furrow in their courſe, as to diſtinguiſh this from the ſecond part or diviſion, which may be properly called the body, or at leaſt appears to be the ſtrong muſcular part of the fiſh. This ſecond diviſion is of a lighter and more clear bluiſh colour than the upper or back part, and ſeems to ſwell out ſomewhat on each ſide, from the depreſſion of the lateral lines; but towards the lower or under part, is again contracted, or ſharpened, into the third part, or carina. This carina, or keel, is very diſtinguiſhable from the other two diviſions by its thinneſs, its apparent laxneſs, and by the reticulated ſkin of a more grey and light colour, with which it is covered. When the animal ſwims gently in pretty deep water, the rhomboidal reticulations of the ſkin of this carina are very diſcernible; but when the water is ſhallow, or the depth of the carina is contracted, theſe reticulations appear like many irregular longitudinal plicæ. The carina begins about ſix or ſeven inches below the baſe of the head, and gradually widening or deepening as it goes along, reaches down to the tail, where it is thinneſt. It ſeems to be of a ſtrong muſcular nature. Where it firſt takes its riſe from the body of the fiſh, it ſeems to be about one inch, or one inch and an half thick, and is gradually ſharpened to a thin edge, where the fourth and laſt part is ſituated, *viz.* a long, deep, ſoft, wavy fin, which takes its riſe about three or four inches at moſt below the head, and runs down along the ſharp edge of the carina, to the extremity of the tail. Where it firſt riſes, it is not deep, but gradually deepens or widens as it approaches the tail. It is of a very pliable, ſoft conſiſtence, and ſeems rather longer than the body. The ſituation of the anus in this fiſh is very ſingular, being placed underneath, and being about an inch more forward than the pectoral fins, and conſequently conſiderably nearer the roſtrum. It is a pretty long rima in appearance; but the aperture muſt be very ſmall, as the formed excrements are only about the ſize of a quill of a common dunghill fowl. There are two pectoral (if I may call them ſo) fins, placed one on each ſide, juſt behind the head, over the *foramina ſpiratoria*, which are ſmall, and generally covered with a lax ſkin, ſituated in the axillæ of theſe fins. Theſe fins are ſmall for the ſize of the fiſh, being ſcarcely an inch in length, of a very thin, delicate conſiſtence, and orbicular ſhape. They ſeem to be chiefly uſeful in ſupporting and raiſing the head of the fiſh when he wants to breathe, which he does every four or five minutes, by raiſing his mouth out of the water: this ſhews that he has lungs, and is amphibious, and *foramina ſpiratoria* ſeem to indicate his having *branchiæ* likewiſe; but this I only offer as a conjecture, not being certain of the fact. I muſt now mention the appearance of a number of ſmall croſs bands, annular diviſions, or rather *rugæ* of the ſkin of the body. They reach acroſs the body down to the baſe of the carina on each ſide; but thoſe that croſs the back ſeem to terminate at the lateral lines, where new rings take their riſe, not exactly in the ſame line, and run down the carina. This gives the fiſh ſomewhat of a worm-like appearanee: and indeed it ſeems to have ſome of the properties of this tribe, for it has a power of lengthening or ſhortening its body to a certain degree, for its own conveniency, or agreeable to its own inclination. I have ſeen this ſpecimen, which I have meaſured three feet eight inches, ſhorten himſelf to three feet two inches; but beſides this power of lengthening or ſhortening his body, he can ſwim forwards or backwards with apparently equal eaſe to himſelf; which is another property of the vermicular tribe. When he ſwims forwards, the undulation, or wavy motion of the fin and carina, begin from the upper part, and move downwards; but when he ſwims backwards, and the tail goes foremoſt, and the undulations of the fin begin at the extremity of the tail or fin, and proceed in ſucceſſion from that backwards to the upper part of the body; in either caſe he ſwims equally ſwift. Every now and then the fiſh lays himſelf on one ſide, as it were, to reſt himſelf, and then the four ſeveral diviſions of his body above-mentioned are very diſtinctly ſeen, *viz.* the vermiform appearance of the two upper diviſions; the retiform appearance of the carina; and the laſt, or dark-coloured fin, whoſe rays ſeem to be exceedingly ſoft and flexible, and entirely at the command of the ſtrong muſcular carina. When he is taken out of the water, and laid on his belly, the carina and fin lie to one ſide, in the ſame manner as the ventral fin of the tertraodon does, when he creeps on the ground. I have been the longer and more particular in the deſcription of the external ſtructure of this animal's body, becauſe I think, as it is of a moſt ſingular nature, and endowed with ſome amazing properties, even the moſt minute circumſtance I was able to obſerve relating to it, ſhould be mentioned.

"The perſon to whom theſe animals belong, calls them *electrical fiſh*; and indeed the power they have of giving an electrical ſhock to any perſon, or to any number of perſons who join hands together, the extreme perſon on each ſide touching the fiſh, is their moſt ſingular and aſtoniſhing property. All the five we have here are poſſeſſed of this power in a very great degree, and communicate the ſhock to one perſon, or to any number of perſons, either by the immediate touch of the fiſh with the hand, or by the mediation of any metalline rod. The keeper ſays, that when they were firſt caught, they could give a much ſtronger ſhock by a metalline conductor than they can do at preſent. The perſon who is to receive the ſhock, muſt take the fiſh with both hands, at ſome conſiderable diſtance aſunder, ſo as to form the communication, otherwiſe he will not receive it; at leaſt I never ſaw any one ſhocked from taking hold of it with one hand only; though ſome have aſſured me, that they were ſhocked by laying one hand on him. I myſelf have taken hold of the largeſt with one hand only, without ever receiving a ſhock; but I never touched it with both hands, at a little diſtance aſunder, without feeling a ſmart ſhock. I have often remarked, that when it is taken hold of with one hand, and the other hand is put into the water over its body, without touching it, the perſon received a ſmart ſhock; and I have obſerved the ſame effect follow when a number joined hands, and the perſon at one extremity of the circle took hold of, or touched the fiſh, and the perſon at the other

extremity put his hand into the water, over the body of the fiſh. The ſhock was communicated through the whole circle as ſmartly as if both the extreme perſons had touched the fiſh. In this it ſeems to differ widely from the torpedo, or elſe we are much miſinformed of the manner in which the benumbing effect of that fiſh is communicated. The ſhock which our Surinam fiſh gives, ſeems to be wholly electrical; and all the phænomena or properties of it exactly reſemble thoſe of the electric aura of our atmoſphere when collected, as far as they are diſcoverable from the ſeveral trials made on this fiſh. This ſtroke is communicated by the ſame conductors, and intercepted by the interpoſition of the ſame original electrics, or electrics *per ſe*, as they uſed to be called.

"The keeper of theſe fiſh informs me, that he catched them in Surinam river, a great way up, beyond where the ſalt water reaches; and they are a freſh-water fiſh only. He ſays that they are eaten, and by ſome people eſteemed a great delicacy. They live on fiſh, worms, or any animal food, if it is cut ſmall, ſo that they can ſwallow it. When ſmall-lived fiſhes are thrown into the water, they firſt give them a ſhock, which kills, or ſtupifies them, that they may ſwallow them eaſily, and without any trouble. If one of theſe ſmall fiſhes after it is ſhocked, and to all appearance dead, be taken out of the veſſel where the electrical fiſh is, and put into freſh water, it will ſoon revive again. If a larger fiſh than they can ſwallow, be thrown into the water at a time that they are hungry, they give him ſome ſmart ſhocks, till he is apparently dead, and then try to ſwallow or ſuck him in; but after ſeveral attempts, finding he is too large, they quit him. Upon the moſt careful inſpection of ſuch fiſh, I could never ſee any mark of teeth, or the leaſt wound or ſcratch on them. When the electrical fiſh are hungry, they are pretty keen after their food; but they are ſoon ſatisfied, not being able to contain much at a time. An electrical fiſh of three feet and upwards in length, cannot ſwallow a ſmall fiſh above two or at moſt three inches and a half long. Since I wrote the above deſcription and remarks, I have had Mr. Bancroft's Eſſay on the Natural Hiſtory of Guiana put into my hands, in which I find an account of this animal; but as I think he has not been very particular in the deſcription of it, I reſolved ſtill to ſend you the above account, that you might judge for yourſelf. I obſerve, that his account, or deſcription, and mine differ in ſeveral things, and amongſt others, where he ſays, that thoſe fiſh were uſually about three feet in length; but the one, of which I have ſent a ſlight deſcription, was three feet eight inches. This ſmall variation might indeed have happened without any error; but I am told, that ſome of them have been ſeen in Surinam river upwards of twenty feet long, whoſe ſtroke or ſhock proved inſtant death to any perſon that unluckily received it."

NATURAL HISTORY of the THORNBACK.

THE Thornback differs from the ſkate, in being leſs, and in being armed with a greater number of ſpines or prickles, from whence it has its name. It has one row on the back, and three on the tail. Mr. Pennant mentions a large one that he had ſeen, which had three rows on the back, and five on the tail. The ſhape of the body, excluſive of the tail, is nearly ſquare, and yet a tranſverſe line, drawn from corner to corner, is longer than a line drawn from the head to the root of the tail, ſo that the fiſh may in reality be ſaid to be broader than it is long. It has no ſcales, but is covered with a kind of ſlime, which renders it extremely ſlippery. The upper part is of a duſky colour, ſpotted with white, and the belly is entirely white; the eyes are very prominent, and placed on the upper part of the head, having no bone or any thing elſe to defend them. On the noſe, and on the inner ſide of the forehead, near the eyes, are a few prickles; and others are irregularly ſcattered on the upper part of the pectoral fins.

If a Thornback is placed with the belly uppermoſt, the noſtrils appear, and are contiguous to the mouth, which is deſtitute of teeth; but the jawbones are as rough as a file. The gills, as in other fiſh of this kind, conſiſt of five holes, placed in a ſemicircular form; and there are two ſemicircles on the lower part of the fiſh, one encompaſſing the breaſt, and the other the lower belly, which is divided from the upper by a bone, where theſe circles touch.

The young fiſh have very few prickles on them, and their backs are often ſpotted with white, each ſpot being encircled with black. Thornbacks are ſometimes found to weigh fourteen or fifteen pounds, but with us they ſeldom exceed eight.

They frequent our ſandy ſhores, and are very voracious; they feed on all ſorts of flat fiſh, and are particularly fond of herrings and ſand eels. Sometimes they feed upon cruſtaceous animals, ſuch as crabs, &c. They begin to generate in June, and produce their young in July and Auguſt, which (as well as thoſe of the ſkate) are called *Maids*, before they are old enough to breed. In November the Thornback begins to be in ſeaſon, and continues ſo later than the ſkate, but the young of both are good at any time of the year.

The fleſh of the Thornback reſembles that of a ſkate, but is leſs delicate, and harder of digeſtion: but the liver is conſidered by ſome as a great delicacy.

NATURAL HISTORY of the STING RAY, or FIRE FLARE.

THIS is diſtinguiſhed from other cartilaginous fiſh, in having a remarkable ſpine on the tail, which is a formidable weapon. The tail is very thick at the beginning; the ſpine is placed about a third the length of the former from the body, and is about ſix inches long, flat on the top and bottom, very hard, and ſharp-pointed, the two ſides of which are thin, and ſharply bearded the whole way. The tail, which extends about four inches beyond the end of this ſpine, gradually becomes ſlender at the extremity.

The ſpine, with which nature has armed this fiſh, has occaſioned the ancients to give many tremendous fables concerning it. Pliny, Ælian, and Oppian, have given it a venom that affects even the inanimate creation. But there is not the leaſt credit to be given to the account of its venomous qualities; though it is ſtill believed by fiſhermen in ſeveral parts of the kingdom. Conſidered, indeed, as a weapon of defence, it is capable of giving a dangerous wound, when it falls on a tendinous part, or on a perſon in a bad habit of body. As to any fiſh having a ſpine charged with actual poiſon, we muſt beg leave to refuſe our aſſent to it, though the opinion is ſanctified by the name of Linnæus.

This ſpecies ſhed their ſpine, and renew them annually; and the new ſpine ſometimes appears before the old one drops off, on which account the Corniſh people call it the Cardinal Triloſt, or three tailed.

The Sting Ray does not grow to the bulk of the others; the eyes are large, and placed in the upper part of the head, and the mouth in the lower. It has a hole behind each eye; the mouth is large, and placed tranſverſely, and the noſe is long and ſharp-

pointed.

pointed. The apertures on the gills are five on each ſide, beginning a little below the mouth, and extending to the breaſt. The ſides are terminated, throughout their whole length, by a broad fin.

The body is quite ſmooth, and almoſt of a circular ſhape; it is thicker in the middle than any other Ray, but grows very thin towards the edges. The upper part of the body is of a dirty yellow colour, the middle part of a dulliſh blue; the lower ſide white, and the tail and ſpine duſky.

NATURAL HISTORY of the ANGEL FISH.

THIS is alſo called the monk-fiſh, and is of a middle nature between rays and ſharks, partaking ſomething of the character of both, though it is an exception to each in the ſituation of the mouth, which is placed at the extremity of the head; it grows to a very large ſize, and ſometimes weighs upwards of one hundred and fifty pounds. The back and ſides are of a dirty aſh-colour, and very rough; and the belly is white. The head is roundiſh at the extremity, and in each jaw there are three rows of teeth, each row conſiſting of eighteen; but the number is not exactly the ſame in all fiſh of this kind; Mr. Pennant mentions one that had five rows of teeth all round the jaws. Like thoſe of all ſharks, the animal can raiſe or depreſs them at pleaſure, by means of muſcles uniting them to the jaws, not being lodged in ſockets as the teeth of cetaceous fiſh are. The tongue is broad, and ſharp at the end; and the noſtrils, which are placed on the upper lip, are wide, and filled with a kind of ſlime; the eyes are ſmalliſh, and behind each is a ſemi-lunar orifice. Inſtead of gills, it has five holes like the thornback. It has two fins, placed near the head, which reſemble wings, and is therefore called the Angel Fiſh; angels being repreſented with wings, the ventral fins are placed in the ſame manner.

This fiſh is frequently found on our coaſts, where it prowls about for prey, like others of the kind. It is extremely voracious, and, like the ray, feeds on flat-fiſh and flounders, which keep near the bottom of the water. It is extremely fierce, and dangerous to be approached. Mr. Pennant acquaints us of an inſtance of a fiſherman, whoſe leg was terribly torn by a large one of this ſpecies, which lay within his nets in ſhallow water, and which he went to lay hold of incautiouſly.

Theſe, as well as the reſt of the genus, have much malignity in their aſpect: their eyes, which are oblong, ſunk into their head, and over-hung by their ſkin, ſeem fuller of malevolence than fire.

Their ſkin, which is very rough, was uſed by the ancients to poliſh wood and ivory, for which purpoſes the moderns uſe that of the greater dog-fiſh. The fleſh was formerly thought a delicacy, but is now neglected even by the pooreſt people, on account of its coarſeneſs and rankneſs.

NATURAL HISTORY of the PICKED DOG-FISH.

THIS fiſh has its name from a ſtrong ſharp ſpine, placed before each of the back fins, which diſtinguiſhes it from the reſt of the Britiſh ſharks. It has a roundiſh oblong body, which is covered with a rough ſkin: the back is of a browniſh aſh-colour, and the belly is white, and ſmoother than the other parts: the eyes are oblong, and covered with a double membrane. The mouth is placed juſt under the eyes, and is armed with a double row of ſmall teeth, which bend from the middle of each jaw towards the corners of the mouth. The noſe is long, and extends greatly beyond the mouth, but is blunt at the end. It has no fin on the lower part of the body, between the vent and the tail, by which it may be diſtinguiſhed from all other fiſh of this kind. It grows to the weight of about twenty pounds, and is frequently taken in the Britiſh ocean and the Iriſh ſea.

The SMOOTH DOG FISH.

This fiſh is deſtitute of teeth, but to ſupply the defect, the bones of each jaw are as rough as a file. The ſkin, as its name implies, is ſmooth, but that of all others of this kind is rough: by this difference it may be readily diſtinguiſhed from the picked Dog-Fiſh.

NATURAL HISTORY of the FISHING FROG, or FROG FISH.

THE Frog-Fiſh reſembles a tadpole or young Frog in ſhape, but it appears a tadpole of enormous ſize; for it ſometimes exceeds five feet in length, and has a mouth above a yard wide. Its deformity is not to be exceeded: the head is conſiderably larger than the whole body; the under jaw projects beyond the upper, and both are armed with ſharp ſlender teeth: there are alſo teeth in the palate, and at the root of the tongue, which is large and broad; the eyes are placed at the top of the head, and are encompaſſed with prickles: immediately above the noſe are two long ſtrings or filaments, which reſemble a fiſhing-line, and it is ſaid the animal converts them to the purpoſes of fiſhing. The back is flat, and greyiſh, with ſomewhat of a reddiſh and greeniſh caſt: it has three briſtles or ſtrings on the middle of the back, which ſeem to ſupply the place of a fin; and ſeveral ſtrings, reſembling fins, hang round the body: two fins are placed under the throat, which reſemble the feet of a mole, by the aſſiſtance of which they creep at the bottom of the ſea.

The fleſh of the Frog-Fiſh is white, when boiled, and taſtes like that of a Frog. The fiſhermen have, in general, a great regard for this ugly fiſh, as it is an enemy to the dog-fiſh; the bodies of thoſe voracious animals being frequently found in its ſtomach; and, whenever they take it, they make a point of giving it its liberty.

NATURAL HISTORY of the WHITE SHARK.

OF all the inhabitants of the deep, thoſe of the Shark kind are the fierceſt and the moſt voracious; but the great White Shark, which is the largeſt of the kind, joins, to the moſt amazing rapidity, the ſtrongeſt appetites for miſchief. In ſize, he approaches nearly to the whale, and far ſurpaſſes him in celerity and ſtrength, in the formidable arrangement of his teeth, and his inſatiable deſire of plunder. Gillius informs us, that the Great White Shark will grow to the weight of four thouſand pounds, and that in the body of one of them a human body was found entire.

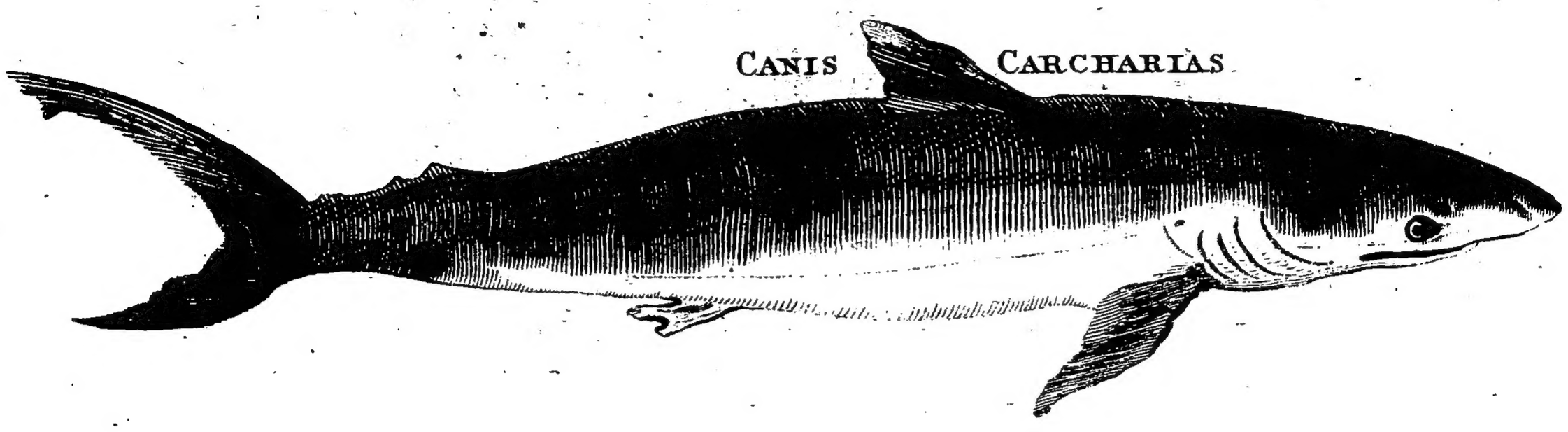
The head is large and flattiſh; the eyes are alſo large, and the ſnout is long. The mouth is enormouſly wide, placed far beneath, and therefore theſe, as well as the reſt of the Shark kind, are ſaid to be obliged to turn on their backs to ſeize their prey; which is an obſervation as ancient as the days of Pliny. The throat is extremely wide, and capable of ſwallowing a man with the greateſt eaſe. But its furniture of teeth is ſtill more terrible: of theſe there are ſix rows, which are flat, triangular, exceedingly ſharp at their edges, and finely ſerrated. It is ſaid there are ſeventy-two in each jaw, but many are of opinion, that their number is uncertain; and that theſe terrible inſtruments of deſtruction increaſe

FISHES.

SEA EAGLE

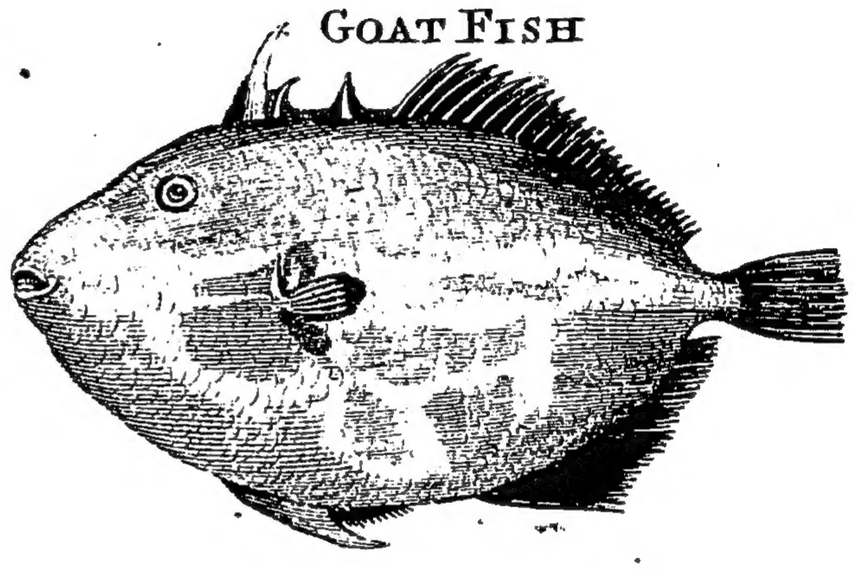
GUAMAJACU ATINGA

CANIS CARCHARIAS

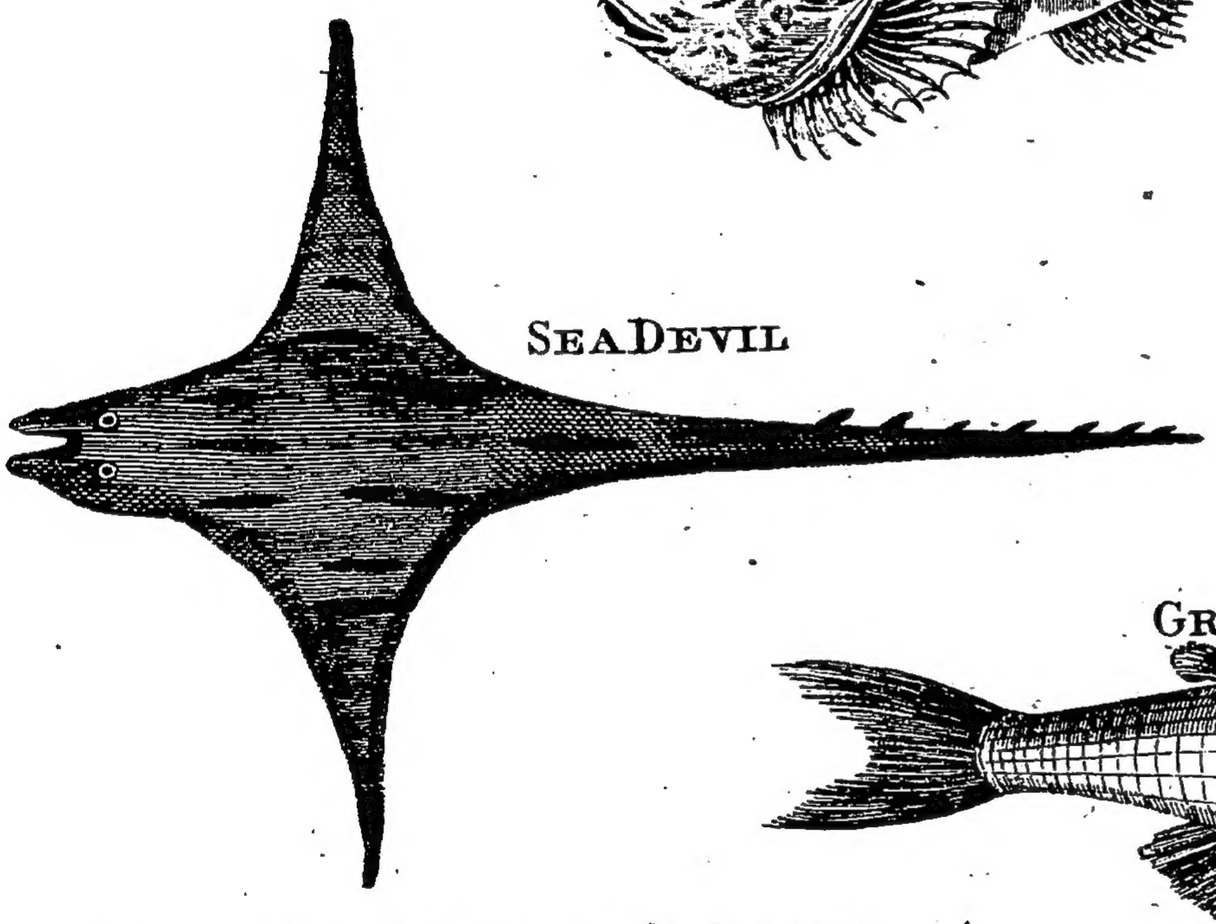


FATHER LASHER

GOAT FISH



SEA DEVIL



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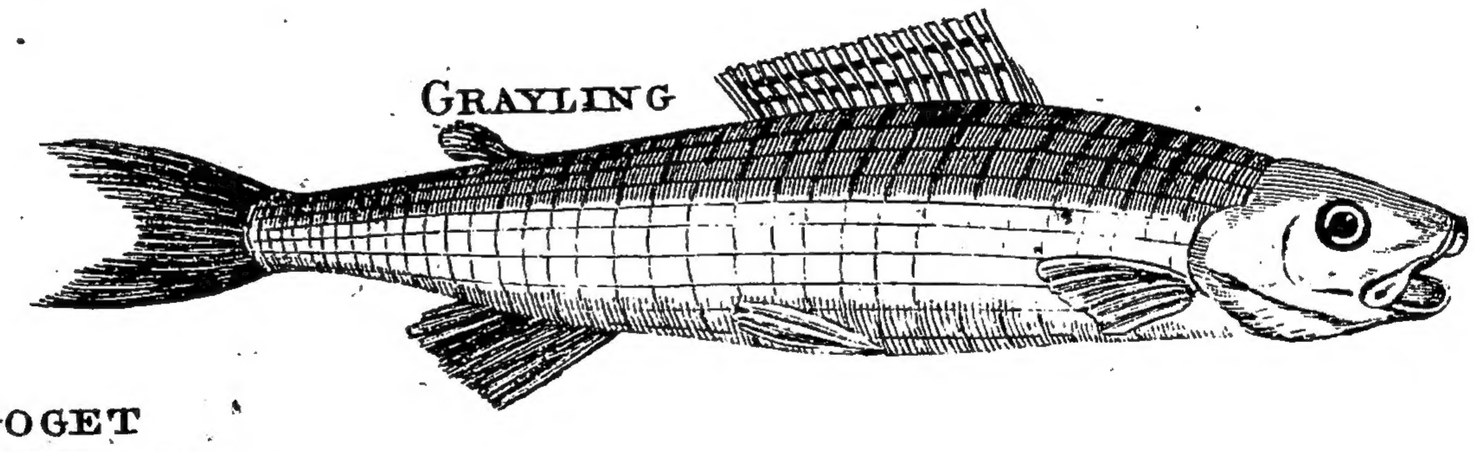
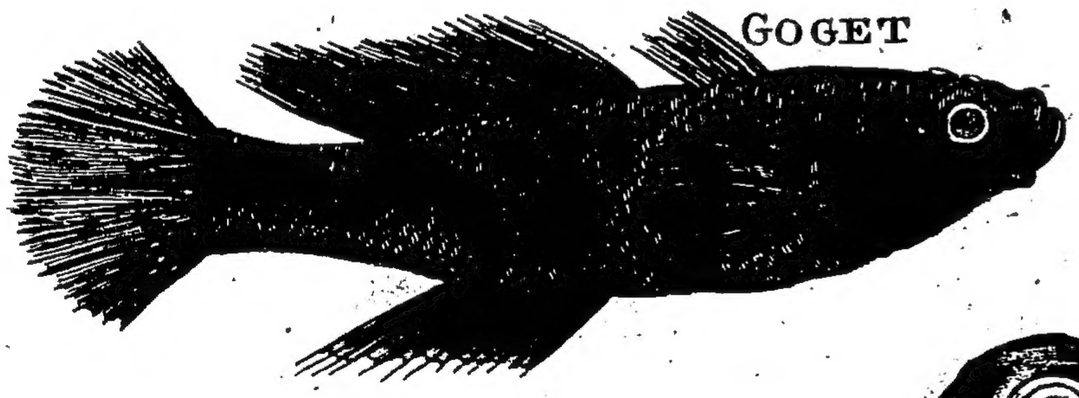
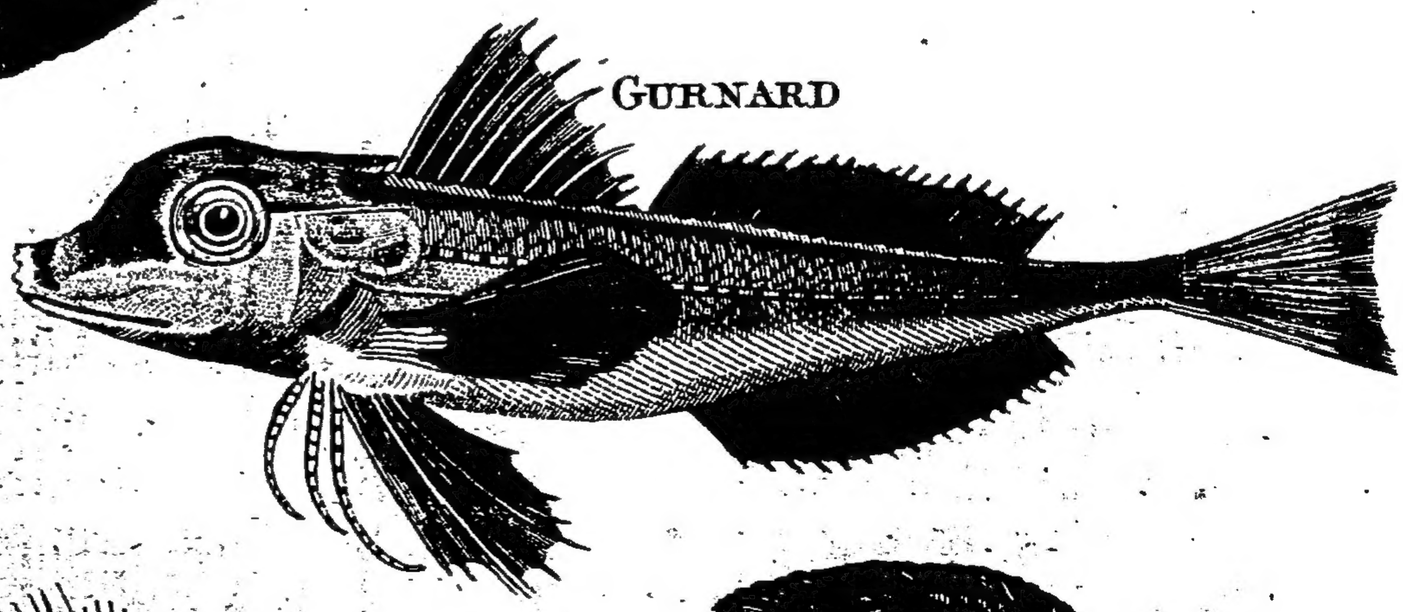


GOGET



GURNARD



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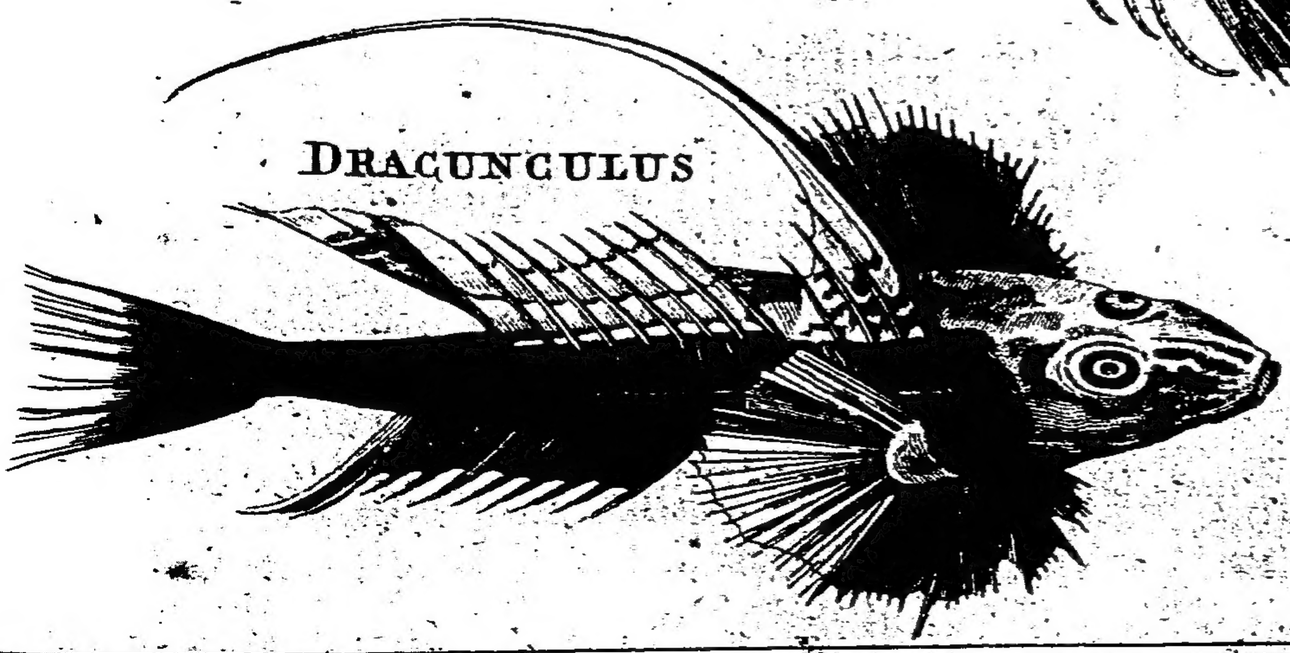


SEA EEL

Published by Alex.r Hogg at the Kings Arms N.o 16 Paternoster Row.

Smith. sculp.

proportion as the animal grows older. When the fiſh is in a ſtate of repoſe, this dreadful apparatus lie flat in the mouth; but, when it ſeizes its prey, it has a power of erecting them, by the aſſiſtance of a ſet of muſcles that join them to the jaw.

The other parts of this fiſh are almoſt equally terrible to behold. Its pectoral fins are very large; it is furniſhed with large goggle eyes, which it turns with pleaſure on every ſide, and can behold its prey behind it as well as before: its whole aſpect is marked with a character of malignity. The tail is of a ſemi-lunar form, but the upper part is longer than the lower. It has vaſt ſtrength in the tail, and can ſtrike with amazing force; on which account the ſailors cut it off with an ax as ſoon as they have got it on board. The colour of the whole body and fins of this animal is a light grey; its ſkin is rough, hard, and prickly; and is that ſubſtance that covers inſtrument caſes, called ſhagreen.

The Shark is as dreadful from his courage and activity, as from his formidable appearance: no fiſh can ſwim faſter, none are ſo conſtantly employed in ſwimming; he outſtrips the ſwifteſt ſhips, plays round them, and ſeems to gaze at the paſſengers, without exhibiting the ſmalleſt ſymptom of an effort to proceed.

The depredations this animal commits are frequent and formidable: in all hot climates he is the dread of the ſailors, where he conſtantly attends the ſhips in expectation of what may fall overboard. Dr. Goldſmith relates, that as a ſailor was bathing in the Mediterranean, near Antibes, in the year 1744, while he was ſwimming about fifty yards from the ſhip, perceived a monſtrous fiſh approaching him: ſtruck with terror at his approach, the poor man cried out to his companions in the veſſel to take him on board; immediately they threw him a rope, and were drawing him up the ſhip's ſide, when the Shark darted after him, and bit off one of his legs. Indeed when a man has the misfortune to be purſued by any of theſe animals, he periſhes without redemption; they having been perceived to dart at them like gudgeons at a worm. "A maſter of a Guinea ſhip," ſays Mr. Pennant, "informed me, that a rage of ſuicide prevailed among his newbought ſlaves, from a notion the unhappy creatures had, that after death they ſhould be reſtored again to their families, friends, and country. To convince them at leaſt that they ſhould not re-animate their bodies, he ordered one of their corpſes to be tied by the heels to a rope, and lowered into the ſea; and, tho' it was drawn up again as faſt as the united force of the crew could be exerted, yet in that ſhort ſpace the Sharks had devoured every part but the feet, which were ſecured at the end of the cord."

So great is the rapacity of the Shark, that nothing which has life is rejected by it: but human fleſh appears to be its moſt favourite food; when once it has fed upon mankind, it continually haunts thoſe places where it expects a return of its prey: it is however aſſerted, that this voracious fiſh will take the black man's fleſh in preference to the white, and that when men of different colours are in the water together, it always makes choice of the former.

The uſual method of taking a Shark, is to bait a hook with a piece of beef or pork, which the ſailors throw into the ſea affixed to a ſtrong cord, ſtrengthened near the hook with an iron chain; as without ſuch precaution the Shark would preſently bite the cord in two, and ſet himſelf at liberty. He approaches it, ſwims round it, and examines it, and appears for a time to neglect it; but when the ſailors make a pretence, by drawing the rope, as if intending to take the bait away, then his hunger excites him, he darts at the bait, and ſwallows it, hook and all. When he finds the hook lodged in his maw, he exerciſes his utmoſt efforts to continue in his natural element; but, when his ſtrength is exhauſted, he ſuffers his head to be drawn above water, the ſailors confine his tail by a nooſe, draw him on ſhip-board, and diſpatch him as ſoon as poſſible, by beating him on the head; yet even this is attended with difficulty and danger; the enormous creature, terrible even in the agonies of death, ſtill ſtruggles with his deſtroyers, and is the moſt difficult to be killed of any animal in the world.

Belonius aſſures us, that he ſaw a female Shark produce eleven live young ones at a time, and that the female in this tribe is larger than the male.

The antients were acquainted with this fiſh: Oppian, in particular, gives a long and very entertaining account of its capture. Their fleſh, which is ſometimes eaten, is exceedingly coarſe and rank, and hardly digeſtible by any but the negroes, who are remarkably fond of it: the liver affords three or four quarts of oil; and the ſkin, as we have already obſerved, is poliſhed into that ſubſtance, known among us by the name of ſhagreen.

The BLUE SHARK.

The back of this animal is of a lively blue colour, and the belly of a ſilver white: it is of an oblong form, and from ſix to eight feet in length: the ſkin is ſmoother than that of other Sharks: the ſnout is long, ſharp, flat, and indented with many ſmall holes above and below: the mouth is large, and placed like that of the white Shark, but it is not furniſhed with ſo many teeth.

Ælian ſays this ſpecies will permit the ſmall brood, when in danger, to ſwim down its mouth, and take ſhelter in its belly. This fact is confirmed by Rondeletius; and, as Mr. Pennant obſerves, it is no more incredible, than that the young of the opuſſum ſhould ſeek an aſylum in the ventral pouch of its parent; a fact too well known to be conteſted. It is probable, that this degree of affection is not peculiar to the blue Shark, but common to the whole genus.

The blue Shark frequents many of our coaſts, particularly thoſe of Cornwall during the pilchard ſeaſon. Though Rondeletius ſays he was an eyewitneſs to its fondneſs for human fleſh, yet it is leſs deſtructive in our ſeas, owing perhaps to the coolneſs of the climate, which is known to abate the fierceneſs of ſome animals, and the venom of others.

NATURAL HISTORY of the SEA FOX, or SEA APE.

THIS animal is called the Sea Fox on account of the length of its tail, and the rank ſmell of its fleſh, which is not unlike that of the Fox. It is ſometimes found ſo large as to weigh upwards of an hundred pounds, and has a round ſhort body, and a ſmall mouth a little below the ſnout, which is ſharp, and armed with teeth. The belly of this fiſh is white, and the back of an aſh colour. This fiſh is principally remarkable for the great length of its tail, which reſembles a ſword, is as long as the whole body, and has a fin at the root of it. It is uſually met with in the Mediterranean ſea, and is ſometimes taken in our ſeas. Some imagine it to be the fiſh called the threſher, from its attacking and overcoming the grampus with its long tail, whenever that ſpecies of whale riſes to the ſurface to breathe.

NATURAL HISTORY of the TOPE.

THE fins, and the upper part of the body of this fiſh, is aſh coloured; the belly is white: the noſe is very long, flat and ſharp pointed, and the noſtrils

noſtrils are placed very near the mouth: the eyes have ſmall pupils in proportion to the bulk of the body, and behind each eye is a ſmall orifice. The teeth, which are very numerous, are ſmall, ſharp, triangular, and ſerrated on their inner edge: they are diſpoſed in three rows. Its ſkin and fleſh has a rank and offenſive ſmell. Mr. Pennant mentions one that was taken on our coaſt in the year 1768, which weighed twenty-ſeven pounds, and was five feet in length; but they grow to a much larger ſize, and ſometimes exceed an hundred pounds in weight. This is very fierce and voracious, and will even purſue its enemy to the edge of the ſhore.

NATURAL HISTORY of the SAW FISH.

THIS animal has its name from a ſaw, which the bones of its noſe is ſuppoſed to reſemble; but they bear a greater ſimilitude to the teeth of a comb, placed at ſome diſtance from each other: they are placed on each ſide of the bone, and are from twenty to thirty in number, and ſome of them are near five feet in length, when the body of the fiſh is about ten feet. The back of this fiſh is of an aſh colour, and the belly white: it has no teeth in its mouth, which is tranſverſely cleft, but the lips are as rough as a file. The Saw Fiſh has no fins on the back, and four on the belly, two on each ſide, thoſe next the head being the broadeſt and longeſt. The eyes ſtand high out of the head, and the mouth is directly underneath the eyes: the noſtrils are oblong. Theſe animals are great enemies to the whale and fin-fiſh; many of them aſſembling round one, which they never quit till they have deſtroyed. They feed only on his tongue; and leave the reſt behind. The Saw Fiſh inhabits different parts of the ocean, but in the north ſeas they are found in the greateſt plenty; perhaps becauſe great numbers of whales inhabit thoſe ſeas.

NATURAL HISTORY of the STURGEON.

THE Sturgeon grows to the length of eighteen feet, and to the weight of five hundred pounds, but it is ſeldom taken in our rivers of that bulk. The noſe is very long, ſlender, and ends in a point; on the lower part of the noſe are four beards: the mouth, which is ſituated far beneath, is ſmall, and unſupported by any jaw-bones; neither is it furniſhed with any teeth. The eyes are extremely ſmall, and the noſtrils are placed near them. The whole under-ſide of the fiſh, from the end of the noſe to the vent, is entirely flat; and on the back is a ſingle fin, not very remote from the tail. It has alſo two pectoral fins, two ventrals, and one anal fin. The upper part of the body is of a dirty olive colour; the lower part ſilvery, and the middle of the tubercles white. It is an exception among the cartilaginous fiſh in the manner of breeding, being like the bony fiſh oviparous, ſpawning in winter.

In its general form it reſembles a freſh-water pike. Though it is harmleſs and ill provided for war, the body is formidable enough to appearance. It is long, pentagonal, and covered with five rows of large bony knobs, one row on the back, and two on each ſide, and a number of fins to give it greater expedition. Of this fiſh there are three kinds; the common Sturgeon, the caviare Sturgeon, and the Huſo, or Iſinglaſs Fiſh. The firſt has eleven knobs or ſcales on the back; the ſecond has fifteen; and the latter thirteen on the back, and forty-three on the tail. Theſe differences ſeem ſlight to us who only conſider the animal's form; but thoſe who conſider its uſes find the diſtinction of conſiderable importance. The firſt is the Sturgeon, the fleſh of which is ſent pickled into all parts of Europe. The ſecond is the fiſh from the roe of which that celebrated delicacy called caviare is made; and the third, beſides ſupplying the caviare, furniſhes alſo the valuable commodity of iſinglaſs. They all grow to a very large ſize.

This fiſh viſits every country in Europe at different ſeaſons; it annually aſcends the largeſt rivers to ſpawn, and propagates in an amazing number. The inhabitants along the banks of the Po, the Danube, and the Walga, make great profit annually of its incurſions up the ſtream, and have their nets prepared for its reception. The Sturgeon alſo is brought daily to the markets of Rome and Venice, and they are known to abound in the Mediterranean ſea. Yet thoſe that keep entirely either in ſalt or freſh water are but comparatively ſmall. When the Sturgeon enjoys the viciſſitude of freſh and ſalt water, it is then that it grows to an enormous ſize, ſo as almoſt to rival even the whale in magnitude.

England receives frequent viſits from this much eſteemed fiſh. It is often accidentally taken in our rivers in ſalmon nets, particularly in thoſe parts that are not far remote from the ſea. The largeſt we have heard of caught in Great Britain, was a fiſh taken in the Eſke, where they are moſt frequently found, which weighed four hundred and ſixty pounds. An enormous ſize to thoſe who have only ſeen our freſh water fiſhes.

North America alſo furniſhes the Sturgeon; their rivers in May, June, and July, ſupply them in very great abundance. At that time they are ſeen ſporting in the water, and leaping from its ſurface ſeveral yards into the air. When they fall again on their ſides, the noiſe is heard in ſtill weather at ſome miles diſtance.

But the greateſt numbers are to be found in the lakes of Friſchehaff and Curiſchaff, near the city of Pillau. The adjacent ſhores are formed into diſtricts, and farmed out to companies of fiſhermen, ſome of which are rented for ſix thouſand gilders per annum. In the rivers alſo that empty themſelves into the Euxine Sea, this fiſh is caught in great numbers, particularly at the mouth of the river Don. In all theſe places the fiſhermen regularly expect their arrival from the ſea, and have their nets and ſalt ready prepared for their reception.

As the Sturgeon is not a voracious fiſh, it is never caught by a bait in the ordinary manner of fiſhing, but always in nets. From the deſcription given above of its mouth, it is not to be ſuppoſed that the Sturgeon would ſwallow any hook capable of holding ſo large a bulk and ſo ſtrong a ſwimmer. Indeed it never attempts to ſeize any of the finny tribe, but lives by rooting at the bottom of the ſea, where it makes inſects and ſea-plants its whole ſubſiſtence. From this quality of floundering at the bottom it has received its name; which comes from the German verb *ſtoeren*, ſignifying to wallow in the mud. It is obvious to all thoſe who cut it open, that it does not ſubſiſt upon large animals, for nothing is found in its ſtomach but a kind of ſlimy ſubſtance; whence ſome imagine it lives only upon air and water. Hence aroſe a German proverb, applied to a man extremely temperate, when they ſay he is as moderate as a Sturgeon.

The Sturgeon is as timid in its nature as temperate in its appetites. There would be ſcarce any method of taking it, did not its natural deſire of propagation induce it to incur ſo great a variety of dangers. The ſmalleſt fiſh is alone ſufficient to terrify a ſhoal of Sturgeons; for, being unfurniſhed with any weapon of defence, they truſt entirely to their ſwiftneſs, and their caution for ſecurity. Like all animals that do not make war upon others, Sturgeons live in ſociety among themſelves; rather for the purpoſes of pleaſure, than from any power of

mutual

mutual protection. Gesner asserts, that they are delighted with sounds of various kinds; and that he has seen them shoal together, at the notes of a trumpet.

The usual time for the Sturgeon to come up rivers to deposit its spawn, is about the beginning of summer, when the fishermen of all great rivers make a regular preparation for its reception. The nets in which the Sturgeon are caught, are made of small cord, and placed across the mouth of the river; but in such a manner that, whether the tide ebbs or flows, the pouch of the net goes with the stream. The Sturgeon thus caught, while in the water, is one of the strongest fishes that swim, and often breaks the net to pieces that incloses it; but the instant it is raised with its head above water, all its activity ceases: it is then a lifeless, spiritless lump, and suffers itself to be tamely dragged on shore. It has been thought prudent, however, to draw it to shore gently; for, if excited by any unnecessary violence, it has been found to break the fishermen's legs with a blow of its tail. The most experienced fishers, therefore, when they have drawn it to the brink, keep the head always elevated, which prevents its doing any mischief with the hinder part of the body: others, by a noose, fasten the head and tail together: and thus, without immediately dispatching it, bring it to the market, if there be one near; or keep it till their number is completed for exportation.

The flesh of the Sturgeon, pickled, is very well known at all the tables of Europe; and is even more prized in England, than in any of the countries where it is usually caught. The fishermen have two different methods of preparing it. The one is by cutting it in long pieces lengthwise, and having salted them, hang them up in the sun to dry: the fish thus prepared, is sold in all the countries of the Levant, and supplies the want of better provision. The other method, which is usually practised in Holland, and along the shores of the Baltic, is to cut the Sturgeon crosswise into short pieces, and put it into small barrels, with a pickle made of salt and saumure. This is the Sturgeon which is sold in England; and of which great quantities came from the north, until we gave encouragement to the importation of it from North America. From thence we are very well supplied; but it is said, the fish are inferior to those imported from the north of Europe.

A considerable trade is also carried on with the roe of the Sturgeon, which is salted and preserved in a peculiar manner, and called Caviare: it is made from the roe of all kinds of Sturgeon, but particularly the second. This is much more in request in other countries of Europe than with us. To all these high-relished meats, the appetite must be formed by degrees: and tho' formerly, even in England, it was frequently served at the politest tables, it is at present sunk entirely into disuse. It is still, however, a considerable merchandize among the Turks, Greeks, and Venetians. Caviare somewhat resembles soft soap in consistence; but it is of a brown, uniform colour, and is eaten as cheese with bread. The manner of making it is this: they take the spawn from the body of the Sturgeon, and freeing it from the small membranes that connect it together, they wash it with vinegar, and afterwards spread it to dry upon a table; they then put it into a vessel with salt, breaking the spawn with their hands, and not with a pestle; this done, they put it into a canvas bag, letting the liquor drain from it; lastly, they put it in a tub, with holes in the bottom, so that, if there be any moisture still remaining, it may run out: then it is pressed down, and covered up close for use.

But the Huso, or Isinglass fish, is caught in great quantities in the Danube, from October to January: it is seldom under fifty pounds weight, and often exceeds four hundred: its flesh is soft, glutinous, and flabby, but it is sometimes salted, which improves the taste of it, and then it turns red like salmon. It is for the commodity it furnishes, that it is chiefly taken. Isinglass is of a whitish substance, inclining to yellow, done up into rolls, and so exported for use. It is serviceable not only in medicine, but many arts. The varnisher, the wine merchant, and even the clothier, are acquainted with its uses; and very large sums are yearly expended upon this single article of commerce. They make it thus: they cut the skin, the entrails, the fins, and the tail of this fish, into small pieces; these are left to macerate in a sufficient quantity of warm water, and they are all boiled shortly after with a slow fire, until they are dissolved and reduced to a jelly; this jelly is spread upon instruments made for the purpose, so that drying, it assumes the form of parchment, and, when quite dry, it is then rolled into the form which we see it in the shops.

This valuable commodity is principally furnished from Russia, where they prepare great quantities surprisingly cheap. The ancients were acquainted with the fish that afforded this drug. Pliny mentions it under the name of Ichthyocolla, and says, that the glue which was produced from it had the same title; and afterwards adds, that it was made out of the belly of the fish.

Sturgeon, says Lemery, was much esteemed by the ancient Romans, and the belly is reckoned best. It contains much oil and volatile salt, and yields a nourishing and solid food, because of its thick and gross juices. It is also hard, toughish, fat, and difficult of digestion; and therefore it is injurious to weak and tender persons, and those who are sick or recovering from illnesses. As Sturgeon is fat, it relaxes the fibres of the stomach and bowels, and renders the body a little soluble. The bones of this fish, taken to the quantity of a dram, are looked upon to be opening, good for rheumatisms and the gravel; they extract what is called mouth or water-glue from it, which is not so soon dissolved as the common sort, but produces the same effects.

Natural History of the SUN FISH.

IT has a broad short body, covered behind with a circular fin, which answers the purpose of a tail, so that it has the appearance of a bulky head, and the body seems to have been cut off in the middle. Its ordinary length is about ten feet, though it is sometimes found to weigh upwards of an hundred pounds. It has a large rough thick skin, but no scales: the back is blackish, and the belly of a silver white; but both the belly and back terminate in a sharp ridge. In proportion to the size of the fish, the mouth is very small, and when opened is roundish. The jaws, which are hard and rough, are armed with several rows of sharp teeth. The eyes are small, and before each is a semi-circular aperture; the pectoral fins are very small, and placed behind them. The dorsal and the anal fins are high, and placed at the extremity of the body: the tail fin is narrower.

Here seems to be no satisfactory reason for calling this animal the Sun-fish: perhaps from the roundness of its body, or from its shining in the night. It is found in the Mediterranean sea, in the ocean, and on the coasts of Cornwall. A fish of this kind was taken near Plymouth, in 1734, which weighed five hundred pounds.

When boiled, it becomes a glutinous jelly, resembling boiled starch when cold, and serves the purposes of glue.

The

The SHORT SUN FISH.

This is much ſhorter and deeper than the other: the back and the anal fins are higher, and the aperture on the gills is not ſemi-circular, but oval. The ſituation of the fins are the ſame in both. Though both theſe kinds are taken on the weſtern coaſts of this kingdom, they are much more numerous in the warmer parts of Europe.

NATURAL HISTORY of the LUMP FISH.

THIS is alſo called the ſea-owl, and in Scotland the cock-paddle. This ſingular fiſh increaſes to the weight of four pounds, and the length of ſixteen inches: the ſhape of the body is like that of the bream, deep, but very thick, and it ſwims edgeways. It is of a blackiſh colour, a little tinctured with red; it has no ſcales, but the ſkin is rough, with ſharp tubercles of a blackiſh colour in every part. There are three rows of crooked ſpines or prickles on each ſide; and another row of the ſame on the top of the back. The belly is of a bright crimſon colour; the pectoral fins are large and broad, almoſt uniting at their baſe. Beneath this is the part by which it adheres to rocks, &c. under the water, and this ſo firmly, that it is very difficult to remove it. It conſiſts of an oval aperture, ſurrounded with a muſcular and ſoft ſubſtance, edged with ſmall appendages like threads, which concur as ſo many claſpers. By the aſſiſtance of this part, it adheres firmly to whatever it pleaſes: on putting a fiſh of this ſpecies, juſt caught, into a pail of water, it fixes itſelf with ſuch force to the bottom, that, on taking the fiſh by the tail, the whole pail may be lifted up, though it holds ſome gallons, and that without removing the fiſh from its hold. However extraordinary this may appear, we have ſufficient teſtimony of the truth of it; for Mr. Pennant informs us, he has *known* an inſtance of the kind.

The mouth of the Lump-fiſh reſembles that of the ſun-fiſh, but is ſomewhat larger: the lips are flat and thick; the jaws are full of teeth, and the noſtrils are tubes or pipes which riſe above the ſkin.

Theſe fiſh are found in great abundance in the Greenland ſeas, during the months of April and May, when they approach the ſhore to ſpawn. They have extremely large roes, which the Greenlanders boil and eat: they are remarkably fat, which renders them more agreeable to the natives, who are fond of oily food.

NATURAL HISTORY of the SEA SNAIL.

THIS animal takes its name from the ſoft and unctuous texture of its body, reſembling the Snail upon land; it is almoſt tranſparent, and quickly diſſolves and melts away. It is but a ſmall fiſh, not exceeding five inches in length. When freſh taken, the colour is of a pale brown: the ſhape of the body is round, and the back fin extends from the head to the tail. Beneath the throat is a round depreſſion, of a whitiſh colour, ſurrounded by twelve broken ſpots, placed in a circle. The head is large, thick and round; the jaws are very rough, but are deſtitute of teeth: the belly is white and very protuberant. It adheres to the rocks, &c. like the other ſpecies. It is found in the ſea, near the mouths of great rivers.

NATURAL HISTORY of the PIKE FISH.

THE body of this fiſh, in the thickeſt part, is not thicker than a ſwan's quill, when the animal is about ſixteen inches long. This is angular, but as the angles are not very ſharp, they are hardly diſcernible till the fiſh is dried. The general colour of this fiſh is an olive brown, marked with ſeveral blueiſh lines, pointing from the back to the belly; which, in dried fiſh, appear like the ſigns of ſo many joints. They are viviparous; for on cruſhing one immediately after it was taken, hundreds of minute young ones were perceived to crawl out.

There is another of this tribe called the ſhorter Pike-fiſh, which is ſhorter and thicker than the former, and is not longer than twelve inches.

The little Pike-fiſh, as its name implies, is very ſmall, not exceeding five inches in length. It is very ſlender, and tapers off to a point.

CHAP. III.

NATURAL HISTORY *of* FISHES *of the* SPINOUS KIND, viz. *the* EEL, *the* SEA-WOLF, *the* LAUNCE, *the* SWORD-FISH, *the* DRAGON-FISH, *the* WEAVER, *the* COD, *the* TORSK, *the* HADDOCK, *the* WHITING, *the* BIB, *the* POOR, *the* COAL-FISH, *the* POLLACK, *the* HAKE, *the* LING, *the* BURBOT, *the* SEA-LEACH, *the* BLENNY, *the* SEA-GUDGEON, *the* BULL-HEAD, *the* POGGE, *the* FATHER-LASHER, *the* DOREE, *the* HOLLIBUT, *the* PLAICE, *the* DAB, *the* FLOUNDER, *the* SOLE, *and the* TURBOT.

Of SPINOUS FISHES.

THESE are obviouſly diſtinguiſhed from the reſt by having a complete bony covering to their gills; by their being furniſhed with no other method of breathing than with gills only; by their bones, which are ſharp and thorny; and their tails, which are placed in a ſituation perpendicular to the body. This is that claſs which alone our later naturaliſts are willing to admit as fiſhes. The cetaceous claſs with them are but beaſts that have taken up their abode in the ocean; the cartilaginous claſs are an amphibious band, that are but half denizens of that element: according to the moderns, it is Fiſhes of the Spinous kind that really deſerve the appellation.

The generality of mankind will hardly allow this diſtinction; but whatever be the juſtice of this preference in favour of the Spinous claſs, it is certain that the cetaceous and cartilaginous claſſes bear no proportion to them in number. Of the Spinous claſſes, above four hundred ſpecies are already known; the numbers of the former are therefore trifling in compariſon, and not above a fifth part of the finny creation.

From the infinite variety in this claſs, it is obvious how difficult a taſk it muſt have been to deſcribe or remember even a part of what it contains. When

ſix hundred different ſorts of animals offer themſelves to conſideration, the mind is bewildered in the multiplicity of objects that all lay ſome claim to its attention. To obviate this confuſion, ſyſtems have been deviſed, which, throwing ſeveral Fiſhes that agree in many particulars into one groupe, and thus uniting all into ſo many particular bodies, the mind that was incapable of ſeparately conſidering each, is enabled to comprehend all when thus offered in larger maſſes to its conſideration.

Of all the beings in animated nature, Fiſhes ſeem moſt to demand a ſyſtematical arrangement. Quadrupeds are but few, and can be all known; birds, from their ſeldom varying in their ſize, can be very tolerably diſtinguiſhed without ſyſtem; but among Fiſhes, which no ſize can diſcriminate, where the animal of ten inches, and that of ten feet, is entirely the ſame, there muſt be ſome other criterion by which they are to be diſtinguiſhed; ſomething that gives preciſion to our ideas of the animal whoſe hiſtory we deſire to know.

Very little is yet known of the real hiſtory of Fiſhes; but of a great many we have full and ſufficient accounts, as to their external form. It would be unpardonable, therefore, in an hiſtory of theſe animals, not to give what we do know; and at leaſt arrange our forces, though we cannot tell their deſtination. In this art of arrangement, Artedi and Linnæus have long been conſpicuous: they have both taken a view of the animal's form in different lights; and from the parts which moſt ſtruck them, have founded their reſpective ſyſtems.

Artedi, who was the foremoſt of the two, perceiving that ſome Fiſhes had hard prickly fins, as the pike; that others had ſoft pliant ones, as the herring; and that others ſtill were deſtitute of that particular fin, by which the gills are opened and ſhut, as the eel, made out a ſyſtem from theſe varieties. Linnæus, on the other hand, rejecting this ſyſtem, which he found liable to too many exceptions, conſidered the fins, not with regard to their ſubſtance, but their poſition. The ventral fins ſeem to be the great object of his ſyſtem; he conſiders them in fiſhes ſupplying the ſame offices as feet in quadrupeds; and from their total abſence, or from their being ſituated nearer the head or the tail, in different Fiſhes, he takes the differences of his ſyſtem.

Theſe arrangements, which are in a great degree arbitrary, and which are rather a method than a ſcience, are always fluctuating; and the laſt is generally preferred to the preceding. There has lately appeared, however, a ſyſtem compoſed by Mr. Gouan, of Montpellier, that deſerves approbation for more than its novelty. It appears the beſt arrangement of this kind that ever was made; in which the diviſions are not only preciſely ſyſtematical, but in ſome meaſure adopted by nature itſelf. This learned Frenchman has united the ſyſtems of Artedi and Linnæus together; and by bringing one to correct the other, has made out a number of tribes, that are marked with the utmoſt preciſion. A part of this ſyſtem, however, we have already gone through in the cartilaginous. In the arrangement of theſe we have followed Linnæus, as the number of them was but ſmall, and his method ſimple. But in that which is more properly called the Spinous claſs of Fiſhes, we ſhall principally follow Mr. Gouan's ſyſtem; the terms of which, as well as of all the former ſyſtems, require ſome explanation. We do not love to multiply the technical terms of a ſcience; but it often happens, that names, by being long uſed, are as neceſſary to be known as the ſcience itſelf.

If we pay due attention to the ſubſtance of the fin of a Fiſh, we ſhall find it compoſed, beſides the ſkin, either of ſtraight, hard, pointed, bony prickles, or ſpines, as in the pike; or of ſoft, crooked or forked bones, or cartilages, as in the herring. The Fiſh that have bony prickly fins, are called prickly finned Fiſh; the latter, that have ſoft or cartilaginous fins, are called ſoft finned Fiſh. The prickly finned Fiſh have received the Greek new-formed name of *acanthopterigii*; the ſoft finned Fiſh have likewiſe their barbarous Greek name of *malacopterigii*. Thus far Artedi has ſupplied Mr. Gouan with names and diviſions. All Spinous Fiſh are divided into prickly finned Fiſh, and ſoft finned Fiſh.

Linnæus, indeed, has taught him to remark the ſituation of the fins: for the ventral or belly fins, which are thoſe particularly to be remarked, are either wholly wanting, as in the eel, and then the Fiſh is called *apodal* (a Greek word, ſignifying without feet;) or the ventral fins are placed more forward than the pectoral fins, as in the haddock, and then the animal is called a *jugular* Fiſh; or the ventral fins are placed directly under the pectoral fins, as in the father-laſher, and then it is called a *thoracic* Fiſh: or, laſtly, the ventral fins are placed nearer the tail than the pectoral fins, as in the minow, and then it is an *abdominal* Fiſh.

The French naturaliſt then mixes and unites theſe diſtributions into two grand diviſions. All the prickly finned Fiſh make one general diviſion; all the ſoft finned Fiſh another. Theſe firſt are diſtinguiſhed from each other, as being either *apodal*, *jugular*, *thoracic* or *abdominal*. Thus there are prickly finned *apodal* Fiſhes, prickly finned *jugular* Fiſhes, prickly finned *thoracic* Fiſhes, and prickly finned *abdominal* Fiſhes. On the other hand, the ſoft finned Fiſhes fall under a ſimilar diſtribution, and make the other general diviſion. Thus there are ſoft finned *apodal* Fiſhes, ſoft finned *jugular* Fiſhes, ſoft finned *thoracic* Fiſhes, and ſoft finned *abdominal* Fiſhes. Theſe general characters are ſtrongly marked, and eaſily remembered. It only remains, therefore, to divide theſe into ſuch tribes as are moſt ſtrongly marked by nature; and to give the diſtinct characters of each, to form a complete ſyſtem with great ſimplicity. This Mr. Gouan has done; and the reader, who can contain in his memory the characteriſtic marks of theſe, will have a tolerable idea of the form of every kind of Spinous Fiſh: but as to the hiſtory and nature of the animal, itſelf, that can only be obtained by information and experience.

Having mentioned a method by which Spinous Fiſhes may be diſtinguiſhed from each other, the hiſtory of each in particular will naturally follow: the hiſtory of any one of this claſs, indeed, very much reſembles that of all the reſt: they breathe air and water through the gills; they live by rapine; each devouring ſuch animals as its mouth is capable of admitting; and they propagate, not by bringing forth their young alive, as in the cetaceous tribes, nor by diſtinct eggs, as in the generality of the cartilaginous tribes, but by ſpawn, or peas, as they are generally called, which they produce by hundreds of thouſands. Theſe are the leading marks that run through their whole hiſtory, and which have ſo much ſwelled books with tireſome repetition.

We ſhall carefully draw this numerous claſs into one point of view, and mark how they differ from the former claſſes; and what they poſſeſs peculiarly ſtriking, ſo as to diſtinguiſh them from each other: the firſt object that preſents itſelf, and that by which they differ from all others, are the bones. Theſe, when examined but ſlightly, appear to be entirely ſolid; yet, when viewed more cloſely, every bone will be found hollow, and filled with a ſubſtance leſs rancid and oily than marrow. Theſe bones are very numerous and pointed; and, as in quadrupeds, are the props or ſtays to which the muſcles are fixed, which move the different parts of the body.

In all Spinous Fiſhes of the ſame kind, the number of bones is always the ſame. It is a vulgar obſervation

ſervation, that fiſhes are at ſome ſeaſons more bony than at others; indeed this ſcarce requires contradiction. It is however true, that fiſh are at ſome ſeaſons much fatter than at others; ſo that the quantity of the fleſh being diminiſhed, and that of the bones remaining the ſame, they appear to increaſe in number, as they actually bear a greater proportion.

It has been already obſerved, that all fiſh of the ſame kind, have the ſame number of bones: the ſkeleton of a fiſh, however irregularly the bones may fall in our way at table, has its members very regularly diſpoſed; and every bone has its fixed place, with as much preciſion as we find in the orders of a regular fabric. But then, Spinous Fiſh differ in the number of bones according to the ſpecies; for ſome have a greater number of fins, by which they move in the water. The number in each is always in proportion to the number and ſize of theſe fins: for every fiſh has a regular apparatus of bones and muſcles, by which the fins are moved; and all thoſe fiſh where they are numerous or large, muſt conſequently be conſiderably bony. Indeed in the larger fiſh, the quantity of fleſh is ſo much, and the bones themſelves are ſo large, that they are eaſily ſeen and ſeparated: but in the ſmaller kinds with many fins, the bones are as numerous as in the great; yet being ſo very minute, they lurk almoſt in every part of the fleſh, and are dangerous as well as troubleſome to be eaten. In a word, thoſe fiſh which are large, fat, and have few fins, are found to be the leaſt bony; thoſe which are ſmall, lean, and have many fins, are the moſt bony of all others. Thus, for inſtance, a roach appears more bony than a carp, becauſe it is leaner and ſmaller; and it is actually more bony than an eel, becauſe it has a greater number of fins.

The Spinous Fiſh, as they partake leſs of the quadrupede in their formation than any others, ſo they can bear to live out of their own element a ſhorter time. In general, when taken out of the water, they teſtify their change by panting more violently and at cloſer intervals; the thin air not furniſhing their gills the proper play; and in a few minutes they expire. Some indeed are more vivacious in air than others; the eel will live ſeveral hours out of water; and the carp has been known to be fattened in a damp cellar.

The method is by placing it in a net well wrapped up in wet moſs, the mouth only out, and then hung up in a vault. The fiſh is fed with white bread and milk; and the net ſometimes plunged into the water. The animal, thus managed, has been known not only to live for a fortnight, but to grow exceedingly fat, and of a ſuperior flavour: from this it appears, that the want of moiſture in the gills, is the chief cauſe of the death of theſe animals; and could that be ſupplied, their lives might be prolonged in the air, almoſt as well as in their own element.

It is, however, impoſſible to account for the different operations of the ſame element, upon animals that, to appearance, have the ſame conformation. To ſome fiſhes, bred in the ſea, freſh water is immediate deſtruction: on the other hand, ſome fiſhes, that live in our lakes and ponds, cannot endure the ſalt water. Whence this difference can ariſe, is not eaſily accounted for. The ſaline quality of the water cannot properly be given as the cauſe; ſince no fiſhes imbibe any of the ſea's ſaltneſs with their food, or in reſpiration. The fleſh of all fiſhes is equally freſh, both in the river, and at the ſalteſt depths of the ocean; the ſalt of the element in which they live, not in the leaſt mixing with their conſtitution. Whence then is it, that animals will live only there, and will quickly expire, when carried into freſh water? It may probably ariſe from the ſuperior weight of the ſea water. As from the great quantity of ſalt diſſolved in its compoſition, it is much heavier than freſh water, ſo it is probable it lies with greater force upon the organs of the reſpiration, and gives them their proper and neceſſary play: on the other hand, thoſe fiſh which are uſed only to freſh water, cannot bear the weight of the ſaline fluid, and expire in a manner ſuffocated in the groſſneſs of the ſtrange element.

Thus it is evident, that there are ſome tribes that live only in the ſea, and others only in freſh water, yet there are ſome whoſe organs are equally adapted to either element; and that ſpend a part of the time allotted them by nature in one, and a part in the other. Thus the ſalmon, the ſhad, the ſmelt, and the flounder, annually quit their native ocean, and viſit our rivers to depoſit their ſpawn. This ſeems the moſt important buſineſs of their lives; and there is no danger which they will not encounter, even to the ſurmounting precipices, to find a proper place for the depoſition of their future offspring. The ſalmon, upon theſe occaſions, is known to aſcend rivers five hundred miles from the ſea; and to brave not only the danger of various enemies, but alſo to ſpring up cataracts as high as a houſe. As ſoon as they come to the bottom of the torrent, they ſeem diſappointed to meet the obſtruction, and ſwim ſome paces back: they then take a view of the danger that lies before them, ſurvey it motionleſs for ſome minutes, advance, and again retreat; till at laſt, ſummoning up all their force, they take a leap from the bottom, their body ſtraight, and ſtrongly in motion; and thus moſt frequently clear every obſtruction. Sometimes indeed it happens, that they have not ſufficient ſtrength to make the leap; and then, in our fiſheries, they are taken in their deſcent. But this is one of the ſmalleſt dangers that attend theſe adventuring animals in their progreſs: numberleſs are the methods of taking them; as well by the hook, as by nets, baſkets, and other inventions. Their capture makes, in ſeveral countries, a great article of commerce; as being cured in ſeveral different manners, either by ſalting, pickling, or drying, they are ſent to all the markets of Europe. They are indeed either freſh, dried, or pickled, very excellent food, and immenſe quantities of them are annually conſumed.

NATURAL HISTORY of the EEL.

THIS is a very ſingular fiſh in many things that relate to its natural hiſtory, and in ſome reſpects borders on the nature of the reptile tribe. During the night it will quit its element to wander along the meadows; not only for the change of habitation, but alſo for the ſake of prey, feeding on the ſnails which it diſcovers in its paſſage.

In winter it ſinks deep into the mud, and continues in a ſtate of reſt like the ſerpent kind. Morton, in his hiſtory of Northamptonſhire, informs us, that in the river Nyne there is a ſpecies of ſmall Eel, with a ſmaller head and a larger mouth than the common kind, which is called the *bed-eel*, and is found in cluſters at the bottom of the river.

The antients adopted extravagant notions about the generation of theſe fiſh; ſuppoſing they were either created from the mud, or that the ſcrapings of their bodies, which they left on the ſtones, were animated and became young Eels. Some moderns have given into theſe, and other equally wild opinions. The appearance of Eels, in ponds that were never ſtocked with them, they knew not how to account for; eſpecially when they were ſo remote, as to make their being met with in ſuch places a phœnomenon. It is however extremely probable, that

many waters are ſupplied with theſe fiſh by the aquatic fowl of prey; in the ſame manner as vegetation is ſpread by many of the land birds, by dropping ſeeds as they carry them to feed their young; and ſuch may be the occaſion of the appearance of Eels in places where they were never ſeen before. With reſpect to the immediate generation of theſe fiſh, it has been ſufficiently proved to be effected in the uſual courſe of nature, and that they are viviparous. They will live out of water longer than any fiſh, and are extremely tenacious of life, as their parts will move a conſiderable time after they are cut in pieces.

The Eel is extremely voracious, and very deſtructive to the fry of fiſh.

The eyes of the Eel are placed at a ſmall diſtance from the end of the noſe: the iris of the eye is tinged with red; the teeth are ſmall, ſharp, and numerous: the under jaw is longer than the upper: beneath each eye is a minute orifice; and at the end of the noſe two others, which are ſmall and tubular. The Eel has a pair of pectoral fins, rounded at their ends; it has alſo a narrow fin on the back, uniting with that of the tail; and the anal fin joins in the ſame manner beneath. The orifice to the gills is behind the pectoral fin.

Eels differ in their colours, from a ſooty hue to a light olive green: thoſe which are called ſilver Eels, have white bellies, and a remarkable clearneſs throughout.

There is a variety of this fiſh, known in the Thames by the name of Grigs, and about Oxford by that of Grigs or Gluts. They have a larger head, a blunter noſe, and a thicker ſkin than the common ſort: neither are they ſo fat, or ſo much eſteemed; nor do they often exceed three pounds in weight.

Common Eels ſometimes grow ſo large as to weigh upwards of twenty pounds, but that is extremely rare. The Eel is the moſt univerſal of fiſh, and yet it is hardly ever found in the Danube, tho' it is very common in the lakes and rivers of Upper Auſtria. Tho' the Romans held theſe fiſh very cheap, the luxurious Syberites were ſo fond of them, as to exempt the perſons who ſold them from every kind of tribute.

Thoſe which are found in rivers, or other clear running waters, are the beſt; as to their ſize it is immaterial: the liver and the gall are extremely acrid. Boerhaave ſays, that no fiſhes have a more acrid gall; and that with a mixture of the galls of the Eel and the pike, made into pills, he hath cured many ricketty children with hard and ſwelled bellies. The Torporific Eel, found in Guiana, in South America, if caught by a hook, violently ſhocks the perſon who holds the line: the ſame Eel touched with an iron rod, held in the hand of a perſon whoſe other hand is joined to another, &c. communicates a violent ſhock to ten or twelve perſons thus joining hands, in a manner exactly ſimilar to that of the electric machine. No ſhock is perceived by the holding the hand in the water near the fiſh when it is neither diſpleaſed nor touched; but if it is angry, it can give a ſhock to a perſon at five or ſix inches diſtance. This ſhock is produced by an emiſſion of electric particles, which the fiſh diſcharges at pleaſure. On the death of the animal no ſuch electric property remains, and then the Indians eat it.

The Eel is a freſh water fiſh; ſometimes it is found in the ſea; not that it is produced there, but becauſe it goes often out of rivers into the ſea, and ſo back again into rivers; it delights in pure and running waters; and they aſſure us it grows lean, poor, and dies at laſt, when confined to muddy water. It requires alſo a great deal of water, for otherwiſe it dies. It is ſaid it cannot bear any conſiderable difference of living; for in caſe it ſhould in ſummer time be conveyed into a much colder water than that wherein it was before, it is ſoon deſtroyed. In the mean time, they ſay, it can live out of the water five or ſix days, provided the north wind blows at that time: it feeds upon roots, herbs, fiſh, inſects, and any thing it can find in the bottom of rivers. Athenæus ſays, he had ſeen Eels in a certain country, which were ſo far tamed, that if they offered them any thing to eat, they would come and take it out of the perſon's hands. This fiſh lives commonly ſeven or eight years.

The Eel is good aliment, and much uſed; it is tender, ſoft, and nouriſhing, becauſe it contains many oily and balſamic parts: it has alſo a great many that are dull, viſcous, and groſs, which make the Eel hard of digeſtion. They eat Eels either roaſted or boiled: thoſe that are roaſted ſeem to be more wholeſome than the other; and the reaſon is, becauſe they are thereby the more digeſted of their viſcous phlegm, than by the other way. They ſhould alſo be well ſeaſoned, and you ſhould drink good wine upon them, in order to help the digeſting of their phlegm in the ſtomach. The fat of an Eel is looked upon to be good to take away the ſigns of the ſmall-pox in the face, to cure the piles, and to make the hair grow: it is alſo put into the ears to help hearing. They make a kind of mucilage of Eel's ſkin, by ſteeping and boiling it in water, which is applied to ſwellings, in order to the ſoftening and diſſolving of them; it is good for hernia's. *Lemery* on Foods.

The CONGER, or CONGER EEL.

This fiſh grows to an enormous ſize. Dr. Borlaſe aſſures us, that they are ſometimes taken near Mount Bay of one hundred pounds weight: and we have been informed, that ſome have been taken near Scarborough, which were ten feet and an half in length, and eighteen inches in circumference in the thickeſt part. The ſhape of the Conger Eel is ſomewhat like that of the common Eel; but they differ from it in the following particulars: their colour is darker, their eyes are much larger in proportion, and the iris is of a ſilver colour. On each ſide it has a ſtraight white broadiſh line, extending from the head to the tail, which ſeems compoſed of a double row of points. The fin placed on the body has its upper edge blackiſh throughout the whole length. The Conger has more bones than the common Eel; and the end of the ſnout or upper chap is furniſhed with two ſhort horns or tubes, from which a liquor may be ſqueezed out; but this is not to be depended upon, being ſometimes found in both kinds, and ſometimes entirely wanting in both kinds.

Though a ſea fiſh, it is ſuppoſed they generate like the freſh water ſpecies: innumerable quantities of what are ſuppoſed to be their fry, come up the Severn about the month of April, preceding the ſhads, which it is ſuppoſed migrate into that river to feed on them. Congers are extremely voracious fiſh, preying upon other fiſh. They, as well as other Eels in general, are remarkably fond of carcaſſes of any kind, and are frequently found lodged in thoſe that have been accidentally taken up. Congers are an article of commerce in Cornwall; great quantities being taken on that coaſt, and exported to Spain and Portugal.

Fiſhermen are much afraid of a large Conger, leſt it ſhould endanger their legs by clinging round them; therefore they kill them as ſoon as poſſible, by ſtriking them on the navel.

In curing them, they are ſlit, and hung on a frame to dry; having a vaſt quantity of fat, which it is neceſſary ſhould exude before they are fit for uſe.

uſe. It is ſaid, that a Conger of an hundred weight will waſte by drying to twenty-four pounds.

The SAND EEL, or LAUNCE.

It reſembles the common Eel in ſhape, being long and round, but it ſeldom exceeds nine or ten inches in length. The colour of the back is blue, varying with green; the ſides and back are of a ſilver white. It is deſtitute of ſcales, has a ſharp ſnout, and a wide mouth without teeth: the lower jaw is longer than the upper, and the upper jaw is moveable, and capable of being protruded; ſo that, when open, the gape is very wide. It has a long fin, which extends almoſt the whole length of the back, is very narrow, and conſiſts of fifty-eight rays: there is alſo a pair of fins at the gills, but none on the belly. The iris is ſilvery. The tail is forked, but the lobes are rounded at their extremities.

Theſe fiſh are found in moſt of our ſandy ſhores, during ſome of the ſummer months: on the receſs of the ſides they conceal themſelves about half a foot in the ſand, in thoſe places where the water is left at the depth of about a foot; and the fiſhermen of Cornwall, and the iſle of Man, ſearch for them with hooks provided for that purpoſe. They are very delicate eating, but they are generally uſed as baits for other fiſh. The female is longer and ſlenderer than the male.

NATURAL HISTORY of the WOLF FISH, or SEA WOLF.

THIS animal has a ſmooth ſlippery body without ſcales. It ſomewhat reſembles an Eel, but is of a browniſh grey, and the ſides are adorned with blackiſh tranſverſe ſhades. The head is large, and flat above the eyes, and the cheeks appear ſwelled and puffed out. It is a moſt voracious fiſh, and, when taken, will faſten on any thing within its reach. The fiſhermen, dreading its bite, endeavour to diſarm it as ſoon as poſſible; they immediately pull out its fore-teeth, and then kill it by ſtriking it behind the head. The Daniſh and German writers ſay, that its bite is ſo hard that it will ſeize on an anchor, and leave the marks of its teeth in it; and that the animal is capable of cruſhing even ſtones with its jaws. It feeds principally on cruſtaceous and ſhell fiſh.

They are taken in the ſea near Yorkſhire and Northumberland: on the Yorkſhire coaſt they have been found of the length of four feet; and Dr. Gronovius informs us, that they have been taken near Hitland upwards of ſeven feet long. This fiſh has ſo diſagreeable an aſpect, that nobody at Scarborough, except the fiſhermen, will eat it, and they prefer it to holibut.

The body of the Wolf Fiſh is long, and a little compreſſed ſideways, and the ſkin wants the lateral line: the tail is round at the end, and conſiſts of thirteen rays: the ſides, back, and fins, are of a livid lead colour, and the ſides and back are marked downwards with irregular obſcure duſky lines.

NATURAL HISTORY of the SWORD FISH.

THE ſnout of this fiſh is the upper jaw produced to a great length, and has a great reſemblance to a ſword, from whence it takes its name. They have been ſeen upwards of fifteen feet in length, and two hundred pounds in weight. The head is thick, the body is long and round, but grows gradually ſmaller towards the tail. The ſnout is one third of the whole length of the fiſh, and is compreſſed at the top and bottom, but ſharp at the point: the under jaw is about four times as ſhort as the upper, and is alſo ſharp-pointed. The mouth is deſtitute of teeth.

The ſkin of the Sword Fiſh is rough but very thin: the colour of the back is duſky, that of the belly a ſilver white. The dorſal fin begins a little above the gills, and extends almoſt to the tail. The tail is forked and almoſt in the ſhape of a creſcent, and it has only one pair of fins at the gills.

The Sword Fiſh is extremely voracious, and particularly a great enemy to the tunny.

It ſometimes frequents our coaſts, but is much more common in the Mediterranean ſea, eſpecially in that part which ſeparates Italy from Sicily, which has been long celebrated for it. The Sicilians, who are very fond of it, buy it up very eagerly, and, at its firſt coming into ſeaſon, give about ſix-pence Engliſh per pound for it. The ſeaſon for it continues from May till Auguſt. The antients cut this fiſh into pieces, and ſalted it, whence it was called *tonus thurianus*, from *Thurii*, a town in the bay of Tarentum, famous for taking and curing it.

The antient method of taking the Sword Fiſh is particularly deſcribed by Strabo, and agrees exactly with that practiſed at this day by the Italians and Sicilians. A man aſcends one of the cliffs that over hangs the ſea to obſerve the motions of theſe fiſh. As ſoon as he perceives any, he gives notice (by ſigns before agreed upon) of the courſe it takes: a fiſherman, who is ſtationed in a boat, climbs up the maſt, and on ſeeing the Sword Fiſh, directs the rowers which way to ſteer. When he thinks he is within reach, he immediately comes down, and ſtrikes a ſpear or harpoon into its body; the handle of which being looſe in the ſocket, ſeparates from it, while the iron part, which is faſtened to a long cord, remains in the body. The fiſh is then ſuffered to weary itſelf with flouncing in the water, and afterwards is drawn into the boat.

NATURAL HISTORY of the DRAGON FISH.

THE head of this fiſh is large and flat at the top; there are two orifices in the hind part, through which it breathes, and through which it alſo forces out the water it takes in at the mouth, in the ſame manner as the cetaceous fiſh. The eyes, which are large, are placed very near each other on the upper part of the head, ſo that in their natural poſition they look upwards: the pupils are of a rich ſappharine blue, and the irides of a fine yellow. The upper jaw projects much farther than the lower; the mouth is very wide, and the teeth are ſmall. It is found as far north as Spitzbergen, and as far ſouth as the Mediterranean ſea. It is alſo frequently ſeen on the Scarborough coaſts. The colours are yellow, blue, and white; the fiſh making a beautiful appearance when it is juſt taken.

This ſpecies grows to the length of about ten inches: the body is ſlender, round, and ſmooth.

The SMALL DRAGON FISH.

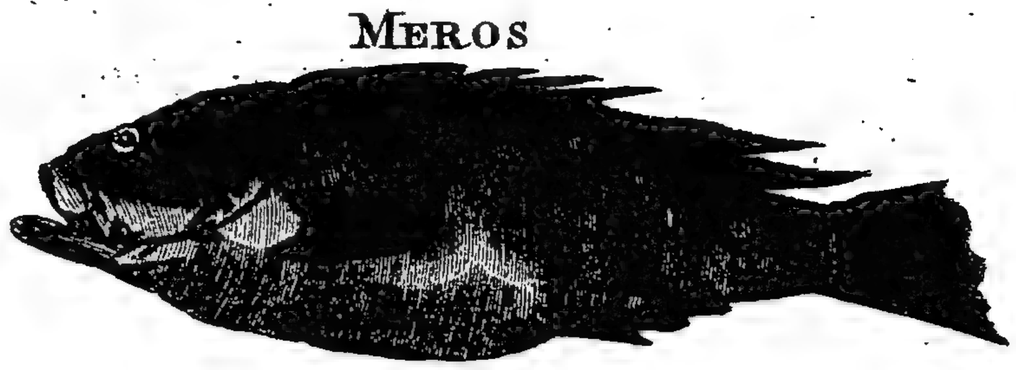
This ſpecies is of a yellowiſh green colour on the back, and white on the belly; the ſides are ſpeckled with ſmall ſpots of a bluiſh ſilver colour. It may be diſtinguiſhed from all other ſmall fiſh by the ſpots juſt mentioned, by the round holes of the gills, by three pointed prickles at the corners of the gills, by the rays of the fore back-fin riſing higher than the membrane that connects them, and by the jaws being furniſhed with exceeding ſmall teeth. The mouth is ſmall, the eyes large, and almoſt contiguous. The Small Dragon Fiſh is ſeldom ſeen to exceed ſix or ſeven inches.

FISHES.

LUPUS MARINUS

LYRA CORNUTA

MEROS



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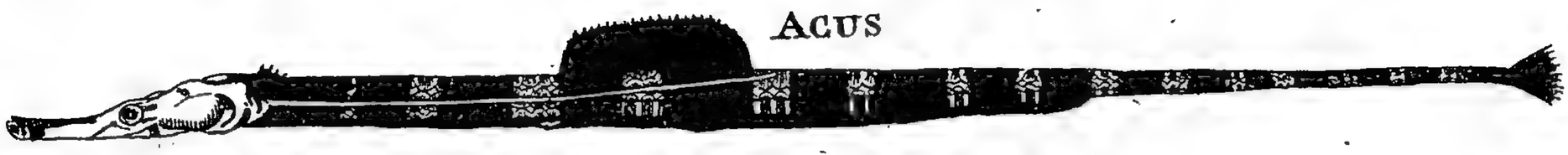

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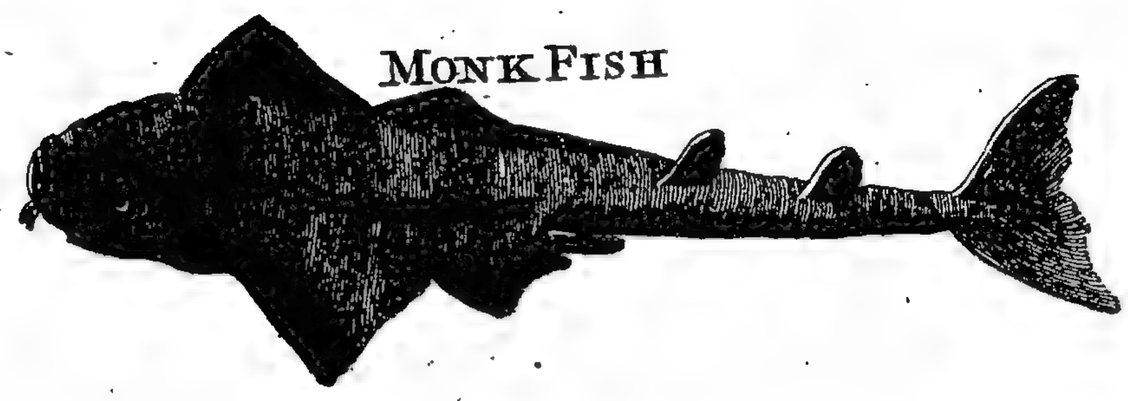

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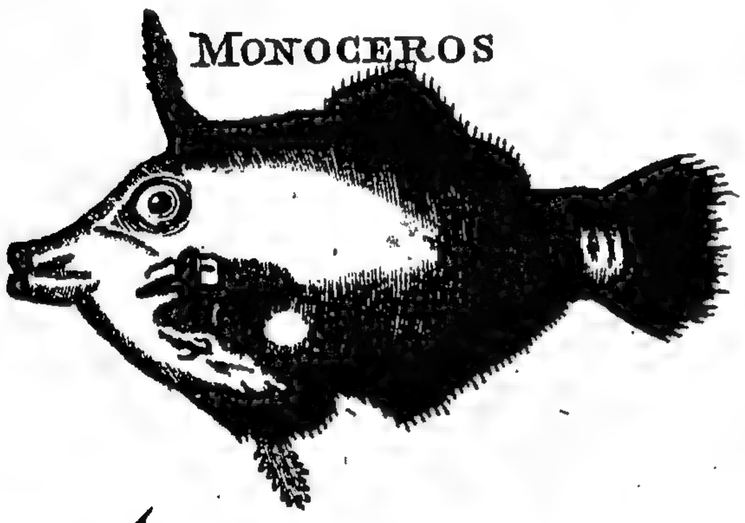

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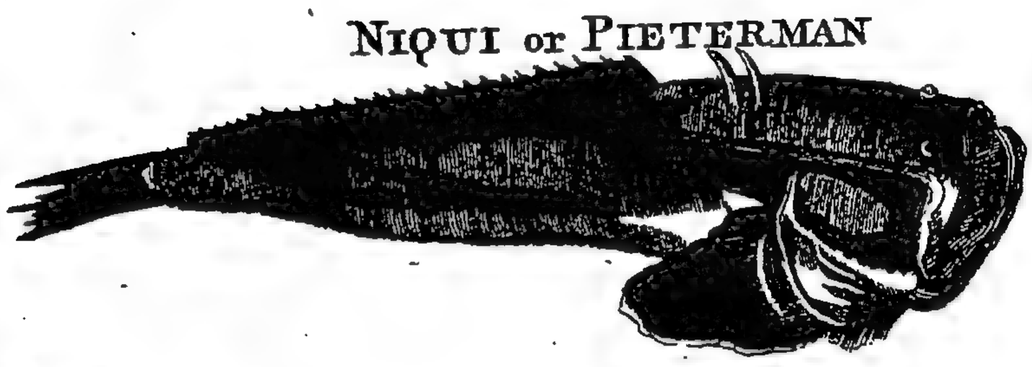

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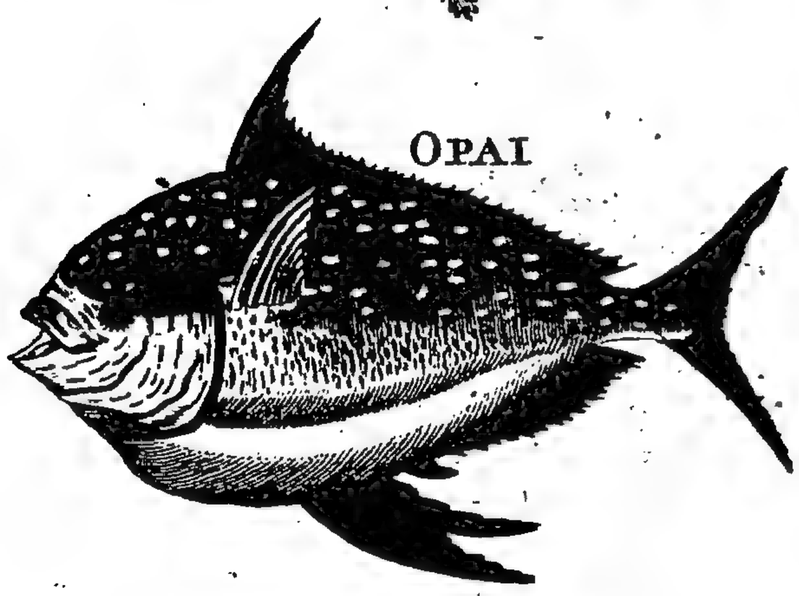

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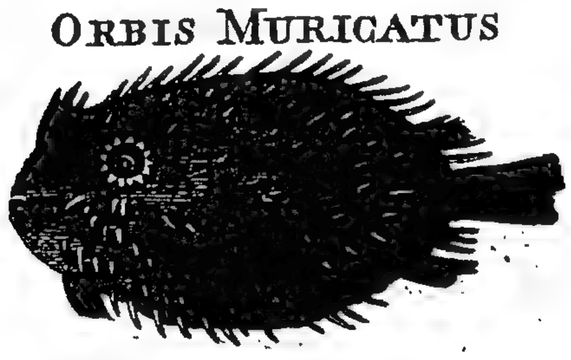

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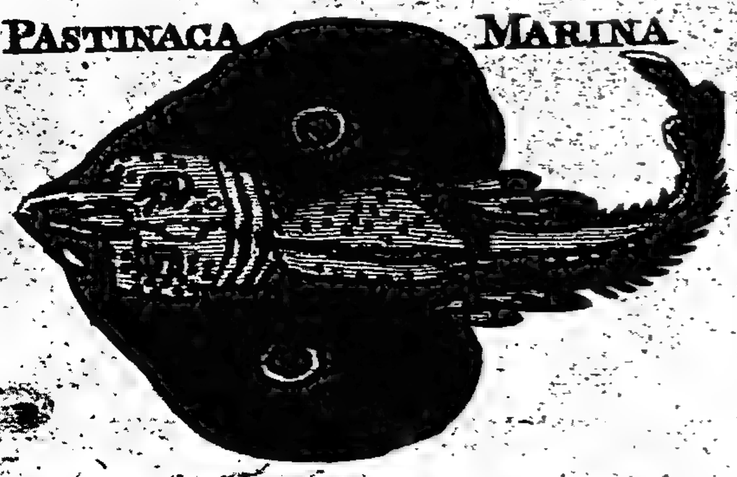
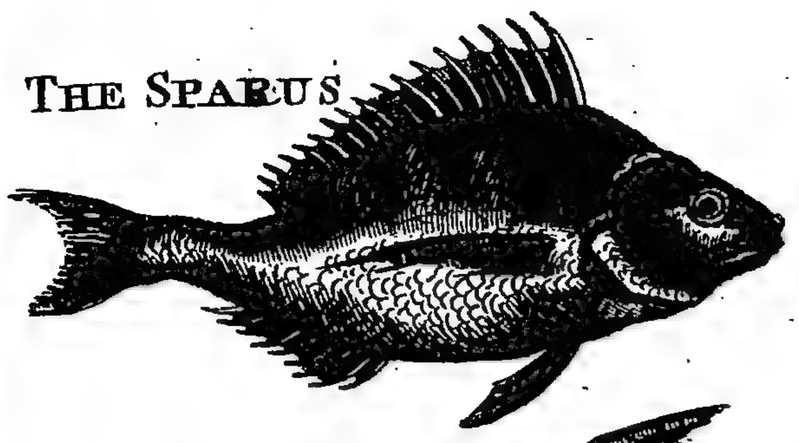


PEACOCK FISH

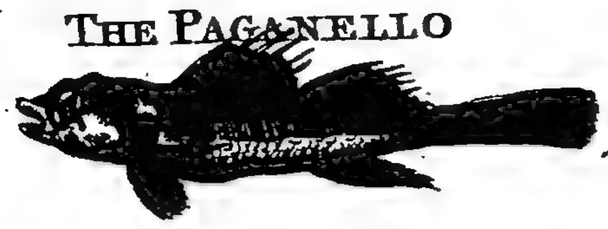
FISHES.

THE GATTORUGINE

THE ZYCENA



THE SPARUS



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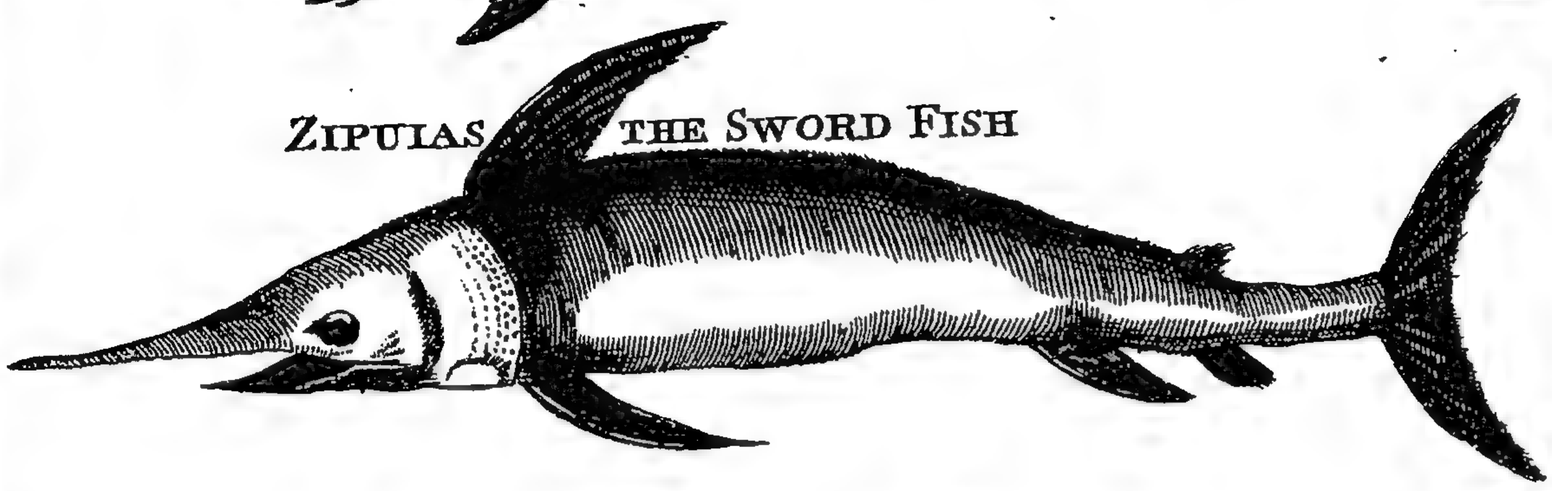
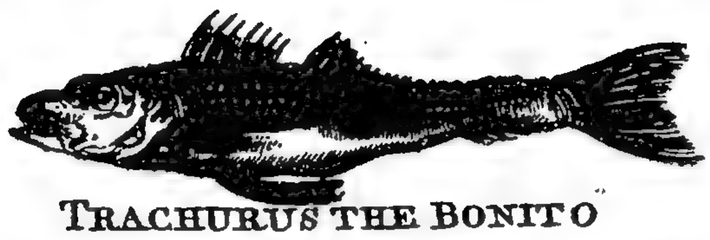
THE MELANURUS



ZIPUIAS THE SWORD FISH

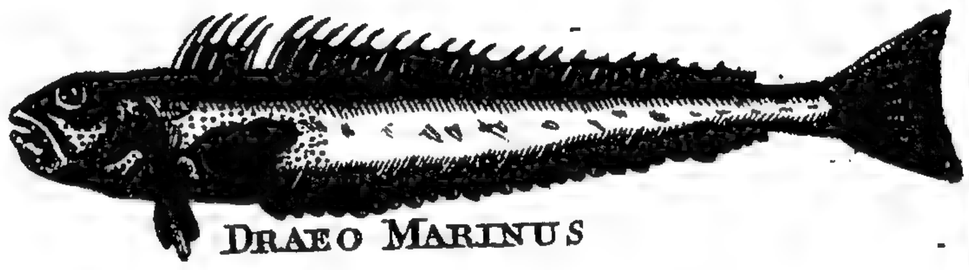
THE SEA PERCH

THE BULLHEAD or MILLARS THUMB

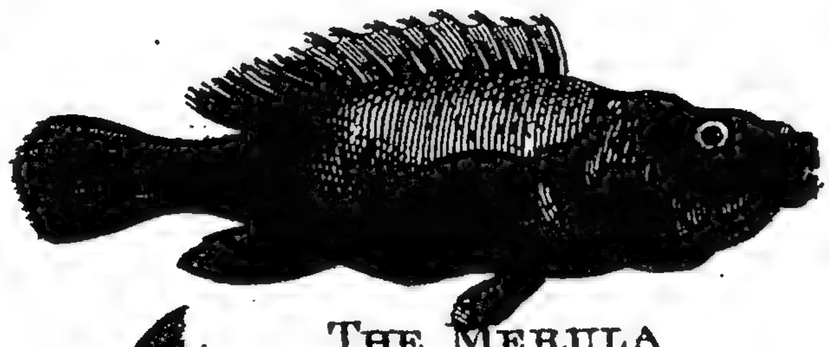


TRACHURUS THE BONITO

THE LUCIOPERCA or PIKE PERCH



DRAEO MARINUS



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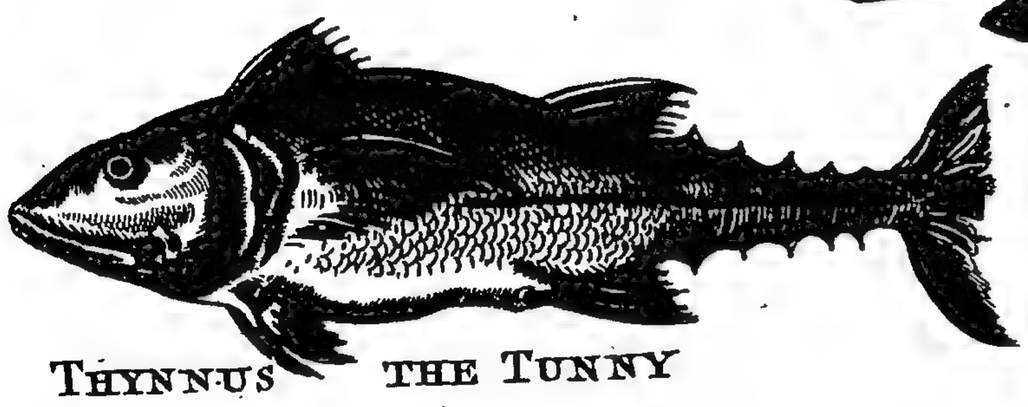
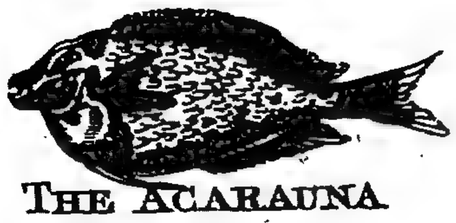


THYNNUS THE TUNNY

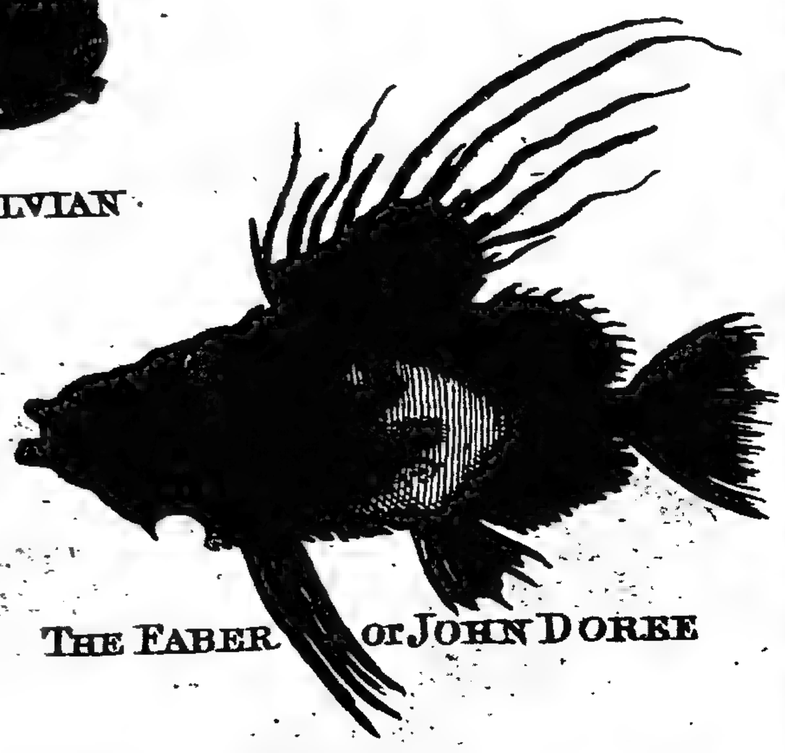
THE LYRA or PIPER



THE ACARAUNA

THE SEA SCORPION OF SALVIAN

THE STARGAZER or UNRANOSCAPUS



THE FABER or JOHN DOREE

Published by Alex.r Hogg at the Kings Arms N.o 16 Paternoster Row

Sparrow sculp.

Natural History of the WEAVER.

THIS fiſh is alſo called the ſea dragon. It is a long fiſh, with flat ſides, a ſtraight back, and a prominent belly. The lines on the ſides are partly yellow, and partly duſky, running obliquely from the back to the belly; the ſcales are thin and ſmall, and the head moderately compreſſed: the eyes are placed on the top of the ſnout, and very near together. The iris of the eyes is yellow; the under jaw is longer than the upper, and ſlopes very much towards the belly: the teeth are ſmall; the forward back-fin has ſix rays; the fin behind this, and which is almoſt cloſe to it, reaches very near the tail.

The antients were well acquainted with the qualities of this fiſh, and mention them without any exaggeration: the wound inflicted by the ſpines that form the dorſal fin are exceedingly painful, attended with a violent burning, and moſt pungent ſhooting; and, if the perſon who receives it is in a bad habit of body, it ſometimes occaſions an inflammation that will extend from the arm to the ſhoulder. Some are of opinion, that theſe ſymptoms proceed from ſomething more than the ſmall wound the fiſh is capable of inflicting. The common remedy uſed by fiſhermen is the ſea-ſand, with which they rub the place affected for a conſiderable time. In the Univerſal Muſeum for 1765, mention is made of a perſon who was dangerouſly wounded by this, and was cured by the application of ſweet oil, and taking opium and Venice treacle.

This fiſh grows to the length of twelve inches. It buries itſelf in the ſands ſomewhat like the ſand-eel, leaving only its noſe out; and, when trod upon, ſtrikes with great violence. Notwithſtanding this noxious quality of the ſpine, the Weaver is very delicate food.

Natural History of the COMMON COD FISH.

THE Cod inhabits only the northern parts of the world: it ſeems confined between the latitudes ſixty-ſix and fifty: thoſe which are caught either north or ſouth of thoſe degrees, being few in number, and bad in quality.

Immenſe quantities of Cod fiſh inhabit the banks of Newfoundland, and the other ſand banks that lie off the coaſts of Cape Breton, Nova Scotia, and New England. It is probable they are tempted to reſort there on account of the quantity of worms produced in thoſe ſandy bottoms. Another cauſe of their particular attachment to theſe ſpots, is their vicinity to the polar ſeas, where they return to ſpawn.

The fiſhing banks of Newfoundland are a ſort of mountains covered with the ſea: one of theſe is deſervedly called the Great Bank, for it extends four hundred and fifty miles in length, and upwards of one hundred in breadth. It is about ſeventy-five miles from the iſland of Newfoundland, in America: the largeſt, beſt, and fatteſt Cod, are thoſe taken on the ſouth ſide of the bank; thoſe on the north ſide being conſiderably ſmaller. The ſeaſon for catching them on this bank, is from the beginning of February to the beginning of May. Thoſe that are taken in May and June will keep tolerably well; but thoſe which are caught in July, Auguſt, and September, will ſpoil in a very ſhort time, unleſs extraordinary care be taken of them. Sometimes, indeed, this fiſhing is over in a month or ſix weeks, and at other times it continues upwards of ſix months.

When Lent approaches, the fiſhermen haſten homewards, though they have not caught above half of their cargo, becauſe the markets at that time are beſt. Sometimes, however, they make a ſecond voyage, before others have got a ſufficient cargo for the firſt. They are all taken with a line and hook baited with the entrails of Cod-fiſh, a ſmall fiſh called capelin, and a ſhell-fiſh called chams; and an expert fiſherman will catch four or five hundred in a day.

On the north of Iceland, very few are taken; but on the ſouth and weſt coaſts they abound. They are found in great plenty on the coaſts of Norway, in the Baltic, and off the Orkney and the weſtern iſles; after which their numbers gradually decreaſe, as they advance towards the ſouth; and before they reach the mouth of the Streights of Gibraltar, they ſeem entirely to ceaſe.

Before Newfoundland was diſcovered, the principal fiſheries of Cod were in the ſeas of Iceland, and of our weſtern iſles; which were the grand reſort of ſhips of all the commercial nations; but the greateſt plenty was found near Iceland. This evidently appears, for queen Elizabeth condeſcended to aſk Chriſtian the Seventh of Denmark permiſſion to fiſh in thoſe ſeas; though ſhe afterwards repented of her requeſt, and inſtructed her ambaſſadors at that court, to inſiſt on the right of a free and univerſal fiſhery.

The increaſe of ſhipping that now reſort to the fertile banks of Newfoundland is aſtoniſhing. Great Britain ſtill enjoys the greateſt ſhare; which ought to be eſteemed as our greateſt treaſure, as it brings ſtrength to the ſtate, and wealth to individuals.

Providence hath benevolently ordained, that this fiſh, ſo uſeful to mankind, ſhould be ſo very prolific as to ſupply more than the deficiencies of the multitudes annually taken. Leuwenhoek counted nine millions, three hundred and eighty-four thouſand eggs in a Cod-fiſh of a middling ſize.

They begin to ſpawn, in our ſeas, in the month of January, and depoſit their eggs in rough ground among rocks.

Thoſe fiſh are moſt eſteemed for the table, which are of a middling ſize, and they are to be choſen by their plumpneſs or roundneſs, eſpecially near the tail, and by the regular undulated appearance of the ſides, as if they were ribbed. Theſe, and other fiſh of this genus, are in the higheſt ſeaſon in winter; but the glutinous parts about the head loſe their delicate flavour, after they have been twenty-four hours out of the water.

The general weight of thoſe taken on our coaſts is from fourteen to forty pounds, though they are ſometimes found to weigh ſixty or ſeventy pounds.

The Cod-fiſh is ſhort in proportion to its bulk; the belly is very large and prominent: the jaws are of an equal length, with a ſmall beard on the lower jaw: the teeth are diſpoſed in the palate as well as the jaws: the eyes are large. This fiſh has three ſoft fins on the back: the ventral fins are very ſlender; and it has two anal fins. It is aſh coloured on the back and ſides, and uſually ſpotted with yellow: the belly is generally white; though they ſometimes vary not only in colour, but in ſhape, eſpecially that of the head. It has a ſide line, which is broad, ſtraight and white, till it reaches oppoſite the vent, when it curves towards the tail.

Cod-fiſh are ſalted in the following manner on board the ſhips: the head is cut off, the belly opened, and the guts taken out; and then they are laid ſide by ſide, head to tail, at the bottom of the veſſels, for about eight or ten feet ſquare. One layer being compleated, it is covered with ſalt, and another laid upon that, which is covered as before. All the fiſh that are taken in one day are thus diſpoſed of; but great caution is uſed not to cure thoſe which have been caught on different days. They remain thus for three or four days, and are then removed into another part of the veſſel, and ſalted again. They

are ſuffered to remain thus till the veſſel has procured its full cargo, or till they depart for their deſtined port. Sometimes they are put into barrels and packed up, and they then go under the denomination of barrel-cod.

Theſe fiſh, however, are not always ſalted, for ſome are dried on ſhore. Such are fiſhed for along the coaſt of Placentia in Newfoundland, from Cape Race to the Bay of Experts; within which limits, there are ſeveral commodious harbours and places to dry the fiſh in. Thoſe who mean to dry them in the ſun, always take them in the ſummer ſeaſon, that being the only proper time for that purpoſe. A ſmaller ſort of fiſh are uſually choſen for drying, becauſe, as they ſooner take ſalt, they are fitteſt for the purpoſe.

The tripes, tongues, and rows of the Cod-fiſh are alſo ſalted and barrelled up; the latter of which are of ſervice to throw into the ſea, in order to draw other fiſh together, particularly pilchards. An oil is taken from this fiſh, which anſwers all the purpoſes of train oil, and is much uſed for dreſſing leather.

NATURAL HISTORY of the TORSK.

THIS fiſh is much eſteemed for its delicacy. On being boiled, the meat divides into flakes like that of the ſalmon. The head is ſmall; the upper jaw ſomewhat longer than the lower. The belly is a little prominent; the ſide line white, broad, and placed nearer the back than the belly. It never grows to a large ſize, ſeldom exceeding thirty inches in length. Theſe fiſh are found in great quantities in the Baltic and the northern ſeas, particularly in Braſſa Sound, where it is called the tuſk, and about the Orkney Iſles. It is indeed ſuppoſed, that they never wander into the more ſouthern ſeas.

NATURAL HISTORY of the HADDOCK.

THE Haddock is of a middle ſize between a whiting and a cod. The back is blackiſh, and covered with ſmall ſcales. A black line extends from the upper corner of the gills to the tail; and on the middle of each ſide, not far from the gills, there is a large black ſpot, which diſtinguiſhes it from all others: the belly and lower parts of the ſides are ſilvery. The eyes are large; a barb hangs from the lower jaw, and the tail is forked. In other reſpects it reſembles a cod; and particularly on the back, are three fins, reſembling thoſe of the common cod. Superſtition aſſigns this mark to the impreſſion St. Peter left with his finger and thumb, when he took the tribute out of the mouth of a fiſh of this ſpecies, which has, ever ſince that miracle, been continued to the whole race of Haddocks.

Large Haddocks begin to be in roe about the middle of November, and continue ſo till the end of January; from which time till May, they are very thin tailed, and much out of ſeaſon. The ſmall ones are extremely good from May till February; and thoſe which are not old enough to breed are good in February, March, and April.

The grand ſhoal of Haddocks comes periodically on the Yorkſhire coaſts. They appeared on the tenth of December, in 1766, and exactly on the ſame day in 1767: theſe ſhoals extended near three miles in breadth from the ſhore; and in length, from Flamborough-head to Tinmouth Caſtle. Three fiſhermen, within the diſtance of a mile from Scarborough-harbour, frequently loaded their boat with them twice a day; taking each time about a ton of fiſh. If they threw their lines beyond the diſtance of three miles from the ſhore, they caught only dog-fiſh; a circumſtance which ſhews how exactly theſe fiſh obſerve their limits.

The largeſt of the Haddocks were ſold for eighteen pence to a ſhilling a ſcore; and the ſmaller ſort were ſold for a penny, and ſometimes an half-penny per ſcore.

This ſpecies, which is the moſt common in the London markets, ſeldom grow very large; one of fourteen pounds being of an uncommon ſize, and extremely coarſe: thoſe of two or three pounds are the beſt for the table.

As ſoon as large Haddocks are out of ſeaſon, they quit our coaſts, and leave behind them a great number of ſmall ones.

NATURAL HISTORY of the WHITING.

THE Whiting is a fiſh of an elegant make, and differs from all other fiſh of this kind, in having the upper jaw longer than the lower; and in the teeth, which appear out of the mouth when it is ſhut. It has no barb, and the belly fins are placed more forward than they are in the others. It is a ſlender fiſh of its ſize, eſpecially towards the tail, for about the head it is conſiderably larger in proportion. The head and back are of a pale brown, the belly is ſilvery; the lateral line is white and crooked: the fins below the vent are ſpeckled with black. The ſcales are ſmall; the eyes are large, and covered with a tranſparent looſe ſkin.

They are the moſt delicate as well as the moſt wholeſome of any of the genus, but never grow very large; the uſual length being ten or twelve inches, though they have been ſeen twenty inches long. In ſpring they appear in vaſt ſhoals in our ſeas, from half a mile to three miles from the ſhore. Vaſt numbers of them are taken by the line, and they afford excellent diverſion to the anglers.

The fiſhing for Whitings in a boat or ſmack is diverſion enough, becauſe they bite very freely, and require no very nice tackle to catch them. You may know where to caſt anchor by the ſea gulls, for they never fail to hover over the place where the Whitings lie, and if they ſeem to dip into the water every now and then, you are ſure not to loſe your labour.

At Portſmouth, the tradeſmen frequently get ſmall ſmelts as baits, and find good diverſion amongſt the Whitings; but if ſmelts are not to be had, a muſcle, a herring, a hairy worm, a lob, or a marſh worm, are good baits. You need not uſe any rod, but a *Pater-noſter* line, with half a dozen hooks half a yard diſtant from each other. The line may be faſtened to the inſide of the boat, by which means you will have but little trouble, except in drawing up your fiſh, and putting on freſh baits. The time of waiting before you examine your hooks need not be long, for they are a very greedy fiſh.

The WHITING-POUT.

In proportion to its length, the Whiting-Pout is extremely broad, by which it may be diſtinguiſhed from all others of the kind. The extremity of the tail and fins are blackiſh, and there are large black ſpots at the roots of the gill fins on each ſide. It never grows to a large ſize, ſeldom exceeding eleven or twelve inches in length. The back is very much arched, the mouth ſmall, and the beard ſhort. The colour of the body is whitiſh, but more obſcure on the back than on the belly. The lateral line is white, broad, and crooked. The back fin, which is of a triangular form, is produced into a longiſh horn; the tail is even at the end, and the ſcales are ſmall. The young of theſe fiſh are called Whiting maps in London,

don, where they are generally very plenty in the month of October.

Natural History of the BIB or BLIND.

THE Bib has a barb under its chin, in which particular it agrees with the cod; but it differs from it in ſize, ſhape, and colour, being ſhorter, broader, and whiter. The ſcales adhere cloſely to the ſkin, and are twice as large as thoſe of the cod. The cod is alſo furniſhed with a ſpine or thorn at the tail fin, of which this fiſh is deſtitute: it grows to the length of eleven or twelve inches: the body is deep, and the ſides compreſſed: the eyes are covered with a looſe membrane, which it is ſaid the fiſh can blow up like a bladder: the mouth is ſmall, and the teeth are diſpoſed like others of the kind. It is eſteemed delicate food, and reſembles the whiting in taſte.

Natural History of the POOR.

THE Poor is the only ſpecies of cod-fiſh with three dorſal fins that has hitherto been found in the Mediterranean ſea. It is found near Marſeilles, and ſometimes in ſuch amazing quantities as to become a perfect nuiſance; for no other kinds of fiſh are taken during that time. It is pretty good for food, but cannot be either ſalted or dried. It is a very ſmall ſpecies, not exceeding ſix inches in length. The back is of a light brown colour, and the belly of a dirty white; the eyes are covered with a looſe membrane: on the chin is a ſmall beard; and on the gill-covers, and the jaws, there are nine punctures on each ſide.

Natural History of the COAL FISH.

THIS fiſh is called the Rawling Pollack in Cornwall. It takes the name of Coal-Fiſh from the colour it ſometimes aſſumes. Theſe fiſh are common on moſt of our rocky and deep coaſts, but particularly thoſe of Northumberland, Yorkſhire, and Cornwall. The fleſh is not ſo good as that of a cod, though it is ſuperior to that of a haddock. The form of the Coal Fiſh is more elegant than that of the cod; they grow to the length of two feet and an half, and weigh about twenty-eight or thirty pounds at moſt. The head is ſmall, the under jaw a little longer than the upper, and the iris is ſilvery, marked with a black ſpot on one ſide. The young appear at the beginning of July, in vaſt ſhoals on the Yorkſhire-coaſt; they are at that time about an inch and an half long. In the month of Auguſt, they are from three to five inches in length, at which time they are taken in great numbers with the angling rod, and are then eſteemed a very delicate fiſh. When large they are ſalted, and dried for ſale.

Natural History of the POLLACK, or WHITING POLLACK.

THIS is larger than the common Whiting, but nearly of the ſame ſhape; it is indeed a little broader, and not quite ſo thick; the back is of a dirty green colour. It differs from a cod fiſh in being ſmaller, broader and thinner; in having a leſſer head, in being deſtitute of a barb, and in having the lower pair of fins much ſmaller. The ſides, beneath the lateral line, are variouſly ſtreaked with a duſky yellow, and the body is ſcaly; but the ſcales are very ſmall. The mouth is large, the teeth ſmall; the eyes are of a ſilver colour, and large; the under jaw is longer than the upper; the head and body riſes pretty high, as far as the firſt dorſal fin. The colour of the back is generally duſky; though in ſome it is inclining to green. The ſides beneath the lateral lines are marked with lines of yellow, and the belly is white.

Theſe fiſh are common in many of our rocky coaſts. In ſummer they are ſeen in great ſhoals frolicking on the ſurface of the water, and throwing themſelves into variety of forms. At that time they are ſo wanton as to bite at any thing that appears on the top of waves, and are frequently taken with a gooſe's feather fixed to the hook. They are a good eating fiſh, but never grow to a very large ſize; they ſeldom exceed ſeven or eight pounds in weight.

The teeth of the Pollack are ſaid to be abſorbent when reduced to powder, and good againſt fluxes and ſpitting of blood.

This fiſh has the Engliſh name of Whiting Pollack beſtowed upon it, from its likeneſs to a whiting. However, it is larger, proportionably broader, and not quite ſo thick. He lives upon fiſh, particularly ſand-eels, and is frequently taken near Penzance and St. Ives, in Cornwall; and is likewiſe often caught in rock-fiſhing. He ſtruggles hard for his life, and yields the angler good diverſion. Proper baits in rock-fiſhing, are ſmall ſmelts, a live ſhrimp, a cockle, a perriwinkle, a lobſter, a marſh-worm, and a hairy worm, that is found under the ſand at the tide of ebb. This laſt, as it is the moſt natural, ſo it is the moſt ſucceſsful bait; beſides, it has this advantage, that it needs no ſcowering as other worms do.

If you fiſh out of a boat or ſmack, you will require no rod, and your line may be ſixty yards long, with three or four hooks one above another, and baited with different baits. Some inches above the higheſt hook muſt be fixed about half a pound of lead. When you fiſh, you muſt coil your line in ſeveral rings in your left hand, and holding your lead in your right, throw it as far into the ſea as you can, taking care to hold the loop of your line faſt in your hand, leſt you loſe it. The beſt time for ſea-fiſhing is in warm weather, and early in the morning, or after ſun-ſet, provided the tide has been ebbing near an hour.

Some in this kind of fiſhing chooſe to place themſelves under the covert of a rock, where they ſhelter themſelves, and ſit ſecure from the inclemencies of wind and weather, and this, in a proper ſenſe, may be termed rock-fiſhing. In this caſe a rod is neceſſary, as likewiſe a float. It is common to uſe two hooks, one to lie at the bottom, and one to hang about mid-water; and if a little miſchievous fiſh, called a miller's-thumb, ſhould happen to carry your bait into the clefts of the rocks, you muſt have patience till he thinks proper to come abroad, for there is no dealing with him by force.

Natural History of the HAKE.

THESE fiſh are from a foot and an half to two feet and an half in length. It is of a ſlender form like that of the river-pike, and is therefore ſometimes called the ſea-pike. The back is of a pale aſh colour, and the belly of a dirty white, with ſmall ſcales. The head is broad, and flat, and the mouth large, and full of ſharp teeth, like that of a pike: the eyes are large, and of a gold colour, being covered with a tranſparent membrane. The tail is not forked, but terminates in a right line.

The Hake is from a foot and an half to near twice that length: it is eſteemed a very coarſe fiſh in England, and is ſeldom admitted to table either freſh or ſalted. It is known by the name of *poor John* when it is cured.

There

There was formerly a vaſt ſtationary fiſhery of Hake on the Nymph Bank, off the coaſt of Waterford; but Mr. Smith, in his hiſtory of Waterford, complains of its decline. The irregular migration of fiſh is ſometimes owing to their being purſued and harraſſed by an unuſual number of fiſh of prey; and ſometimes from a deficiency of the ſmaller fiſh, which ſerved them as food.

There is alſo a fiſh called the leſſer Hake, which is found from eleven to eighteen inches long. It is of a pale aſh-colour.

NATURAL HISTORY of the LING.

THIS fiſh takes its name from its length, being a corruption of the word long. It reſembles the hake both in ſhape and colour, except that it is longer, and its ſcales are not cloſely adhering to the ſkin. The body is ſlender; the head flattiſh; the upper jaw longer than the lower: the teeth in the upper jaw are ſmall and very numerous; thoſe in the lower are few, ſlender, and ſharp. It has a ſmall beard on the chin. The tail is round, not forked; and on the back fin there are a multitude of rays. The uſual ſize of a Ling is from three to four feet in length; but they are ſometimes upwards of ſeven feet long.

The fleſh is much better and wholſomer than that of the hake, and is indeed, when cured, preferred to all other ſalt fiſh.

They abound about the Scilly Iſles, on the coaſts of Scarborough, and thoſe of Scotland and Ireland, and form a conſiderable article of commerce: it was even conſiderable ſo long ago as the reign of Edward the Third, an act being made in his 31ſt year for regulating the price of lob, Ling, and cod.

Great quantities are ſalted for exportation, as well as for home conſumption. When cut or ſplit for curing, it muſt meaſure at leaſt twenty-ſix inches from the ſhoulder to the tail: if ſmaller than that, it is not reckoned a ſizeable fiſh, and therefore is not entitled to the bounty on exportation.

They are in perfection in the Yorkſhire ſeas, from the beginning of February to the middle of May. In June they ſpawn, and depoſit their eggs in the ſoft oozy ground of the mouth of the Tees. The males, at that time, ſeparate from the females, and reſort to rocky ground near Flamborough-head, where the fiſhermen take vaſt quantities, without ever finding a ſingle female among them.

The liver of a Ling is extremely white, ſo long as the fiſh continues in ſeaſon, and abounds with a fine flavoured oil; but as ſoon as it goes out of ſeaſon, the liver becomes very red, and affords no oil. This is, in ſome degree, the caſe with cod and other fiſh, but the difference is not ſo very remarkable.

NATURAL HISTORY of the BURBOT, or EEL POUT.

THE body of this fiſh has ſome reſemblance to that of an eel, except that it is ſhorter and thicker: its motions alſo reſemble thoſe of the eel; and it is equally ſmooth, ſlippery, and ſlimy. The head is broad and depreſſed like that of a toad, and the jaws are furniſhed with very ſmall teeth, which make them as rough as a file. The tail is flat and roundiſh. A barb of about half an inch long grows on the under jaw; and there are two ſhort barbs between the noſtrils and the ſnout. The colour of this ſpecies varies; ſome being duſky, others of a dirty green, ſpotted with black, and ſometimes with yellow.

The Burbot is found in the Trent, the Witham, and in the great Eaſtfen, in Lincolnſhire. Though of a very diſguſting appearance when alive, it is a very delicate fiſh for the table. It is extremely voracious.

They are in great plenty in the lake of Geneva, where it is known by the name of the lota. They are ſeldom found in our waters above the weight of two or three pounds, but they are conſiderably larger in ſome places abroad.

Their places of reſort are the ſame as the eels, if within the reach of the tide; and the beſt time to take them is after a ſtorm of thunder and lightning with heavy rain. The beſt bait for them is a ſmall gudgeon, roach, or dace: your hook ſhould be armed, on account of his ſharp teeth, and becauſe he is a vigorous ſtrong fiſh, and ſtruggles hard for life. His fleſh is good and ſweet, and greatly eſteemed. His uſual ſize is from fourteen to twenty inches.

NATURAL HISTORY of the SEA LOACH.

THIS is termed the whiſtle-fiſh in Cornwall. It is from nine to twelve inches in length, and the head is large and flat. Its mouth reſembles that of an eel, furniſhed with numerous ſmall teeth, diſpoſed along the jaws in the form of a broad plate; it has alſo a ſet of ſmall teeth, diſpoſed in a triangular form, in the roof of the mouth. The eyes are near the end of the ſnout, and their iris is of a ſilver colour. The ſcales are very ſmall, and the head, back, and ſides, are variegated with large ſpots of a darkiſh red. In a dent or furrow near the middle of the back, inſtead of a fin, there is a low membrane, or ſkin, edged with very ſmall hairs; by which it may be diſtinguiſhed from all other fiſh of this kind. It varies greatly with regard to the ſpots: ſometimes they are red, ſometimes white, and ſometimes it has no ſpots. The colour of the head and body are of a reddiſh yellow; but the ſides are lighter, and the belly almoſt white. This ſpecies uſually frequents the rocky ſhores of theſe iſlands, and is ſometimes taken with a bait.

NATURAL HISTORY of the CRESTED BLENNY.

THIS is ſometimes found on our rocky ſhores, and is uſually about four or five inches in length. On the head it has a ſmall creſt-like fin, which it can erect or depreſs at pleaſure. It has a triangular lump on the top of the head, between the eyes, which is red about its edges. The colour is brown and ſpotted, and the body is ſlippery and ſmooth.

The SMOOTH BLENNY.

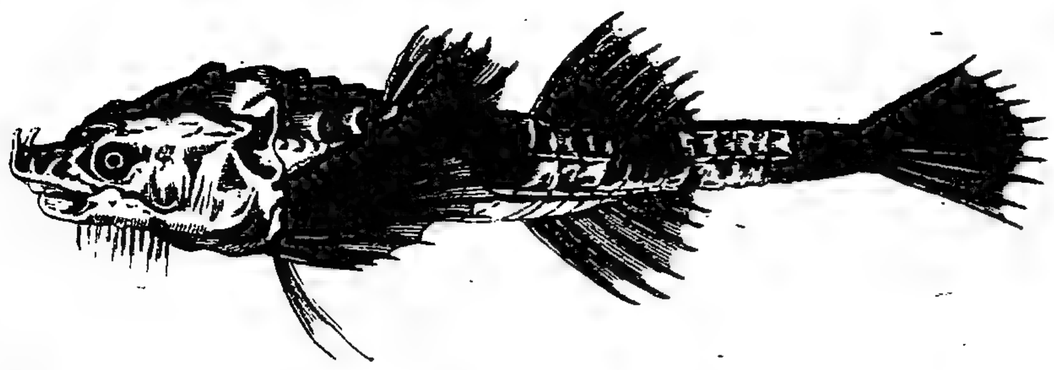
The length of this fiſh is about five or ſix inches: the head is large, and ſloping ſuddenly to the mouth: the iris is red: the teeth are ſharp, ſlender, and cloſe ſet: it has twenty-four in the upper, and nineteen in the lower jaw. The tail conſiſts of twelve branched rays, and is rounded at the end. Some of theſe are black; others of a deep olive colour, marbled with a deeper tint; and others are ſpotted with white. This fiſh is very tenacious of life, and will live almoſt a whole day out of water. It feeds on ſhells, and ſmall crabs.

The SPOTTED BLENNY.

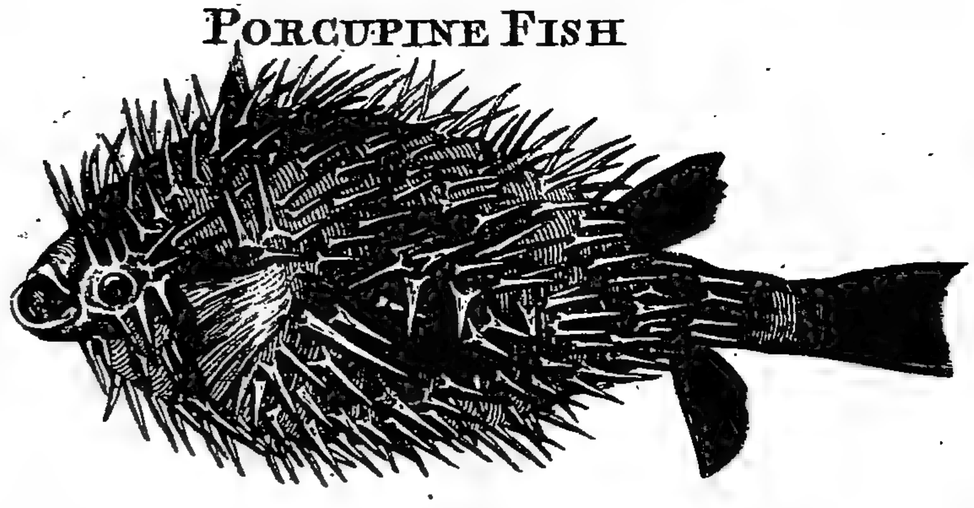
This ſpecies, and the ſmooth Blenny, are found in great plenty, lying under the ſtones among the tang, on the rocky coaſts of Angleſea, at the low water mark, and are uſed as a bait for larger fiſh. It is about ſix inches in length, and half an inch in depth: the ſides are very much compreſſed, and extremely thin: the mouth is ſmall, and the iris of the eye is whitiſh. The pectoral fins are of a yellow colour

FISHES.

POGGE



PORCUPINE FISH



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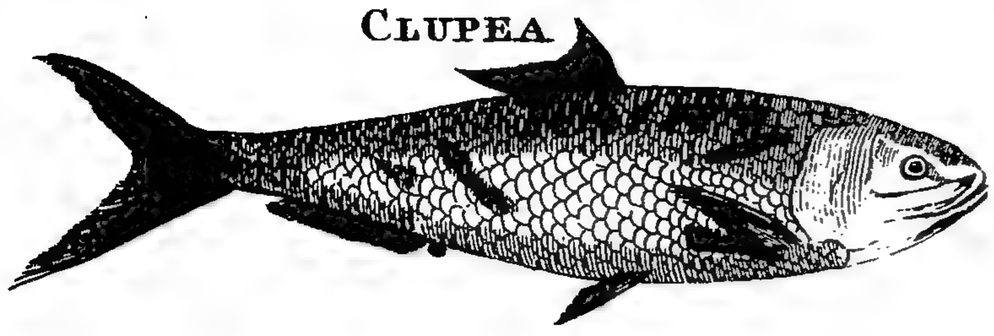
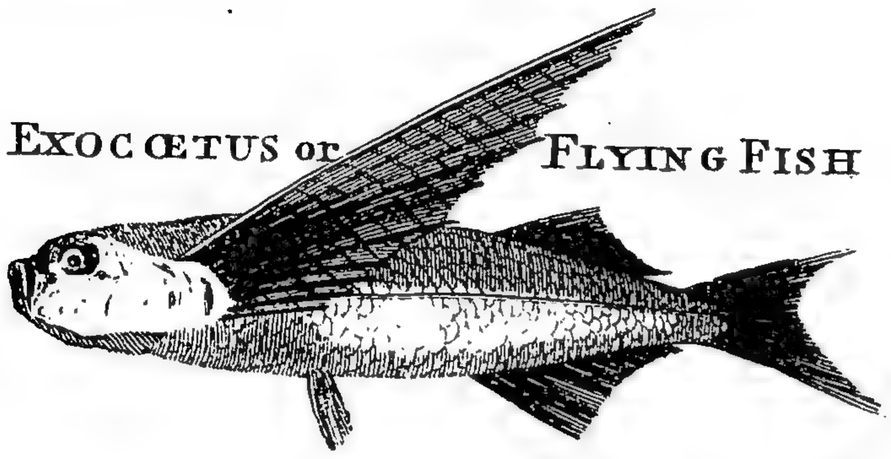


PUDIANO VERDE

EXOCŒTUS or FLYING FISH



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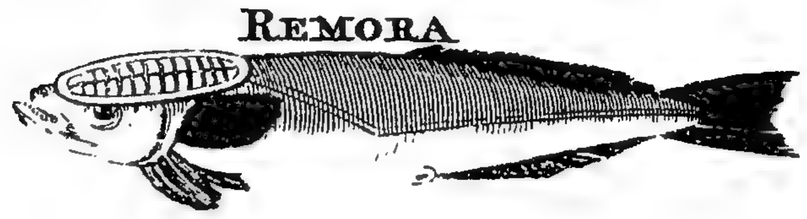
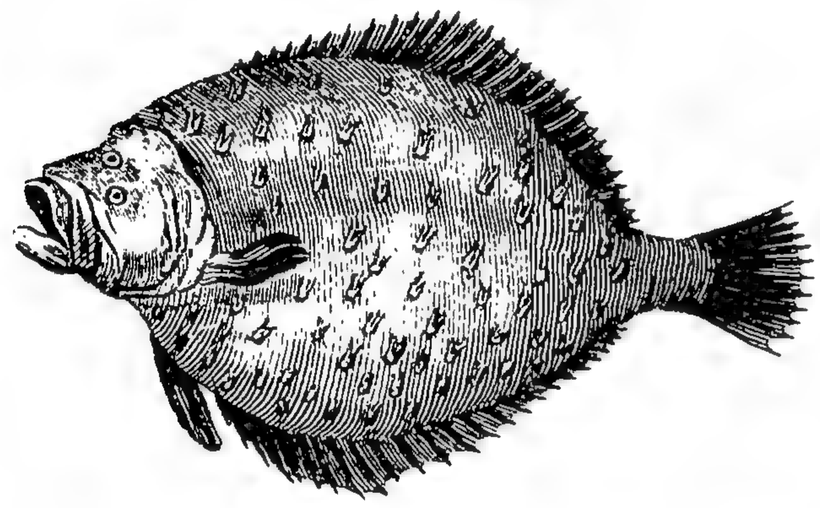
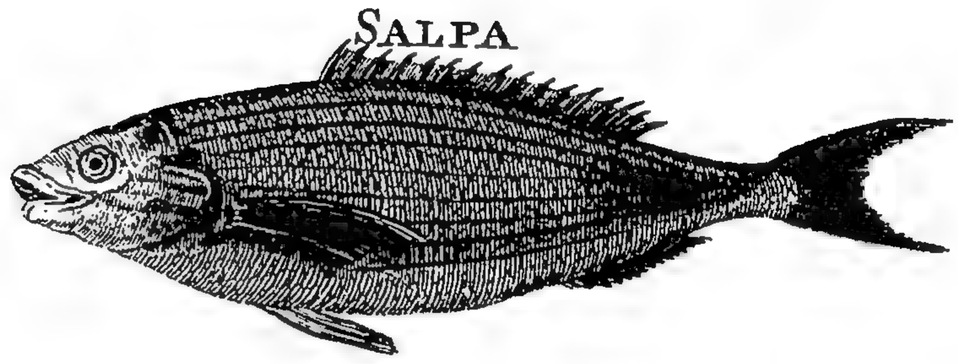


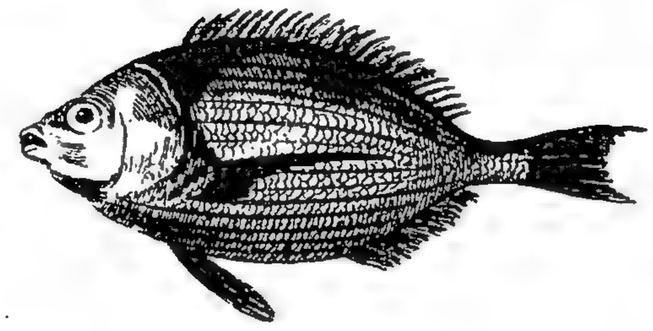
RHOMBUS ACULEATUS



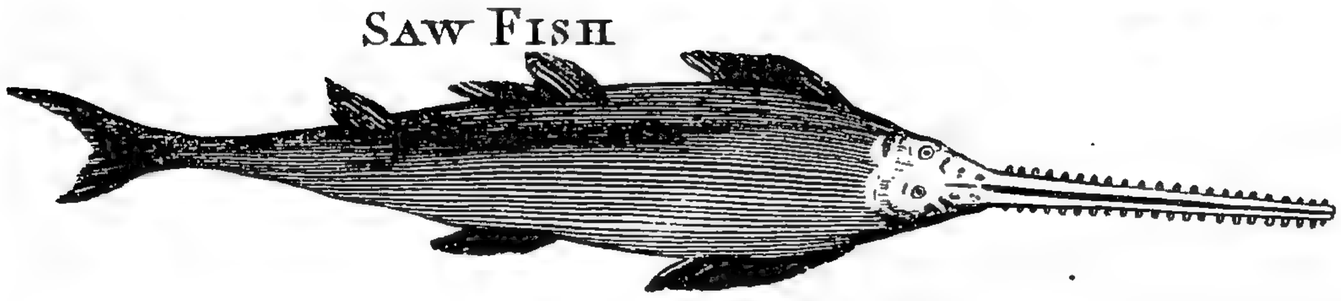
SALPA



SARGUS



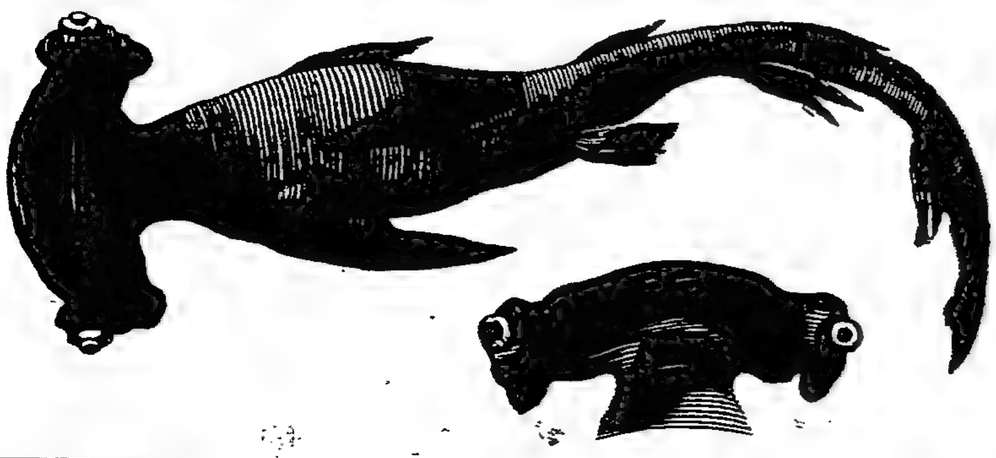
SAW FISH



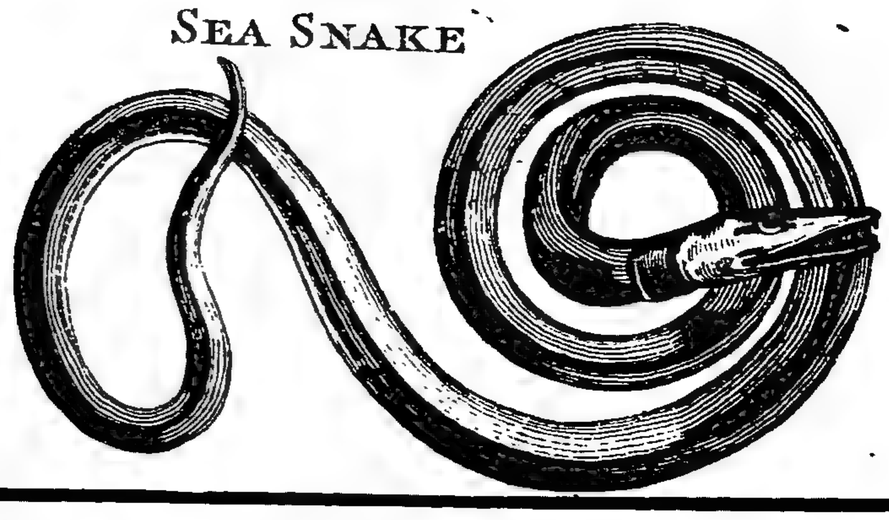
SEA DEVIL or TOAD FISH

BLUE SHARK

HAMMER HEADED SHARK



SEA SNAKE



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Smith sculp.

lour and rounded; and, inſtead of the ventral fins, there are two minute ſpines. The back and ſides are of a deep olive colour, and the belly is whitiſh: the tail is rounded, and of a yellow colour.

The VIVIPAROUS BLENNY.

This ſpecies is generally about a foot in length, and of an eel-like form: the ſkin is ſmooth and ſlippery. The back and head are of a yellowiſh brown, ſtained with black ſtrokes: the ſides are a little lighter, and the belly of a dirty white. It has two ſmall beards at the noſtrils, the jaws are rough, and the covers of the gills are open. It is viviparous, as may be imagined from the name, and brings forth two or three hundred young at a time. Their ſeaſon of bringing forth, is a little after the depth of winter. Before Midſummer, they quit the bays and ſhores, and retire into the deep, where they are uſually taken. They are a coarſe fiſh, and but little eſteemed as food.

NATURAL HISTORY of the SEA GUDGEON, or ROCK FISH.

IT is a ſoft ſlippery fiſh, of a ſlender form, and about ſix inches in length. It is covered with ſmall rough ſcales. It is variegated with a mixture of white, yellow, brown, and other colours, interſperſed with black ſpots; there are alſo tranſverſe ſtreaks of an orange colour. The head is rather large, the cheeks inflated, and the mouth is armed with a double row of rough teeth. The ventral fins coaleſce, and form a ſort of funnel, having the appearance of a double fin in the middle of the breaſt: this enables them to ſtick cloſe to the rocks, from whence they have obtained the name of the Rock Fiſh. The eyes are ſmall and yellow, looking upwards, and placed pretty near each other. The tail is rounded at the end. This fiſh is often taken on the coaſt of Cornwall, and is common in the fiſh-markets of Venice. The fleſh is fat, tender, and delicate.

NATURAL HISTORY of the BULL-HEAD, or MILLER's THUMB.

THIS ſpecies is very common in all our clear brooks: it is about four or five inches in length, with a large broad depreſſed head of a roundiſh ſhape. The gill fins are round, and notched on the circumference. The eyes are ſmall; the iris of the eyes is yellow: the teeth are very minute, and placed in the jaws and the roof of the mouth. The body grows ſlender towards the tail, and is very ſmooth. At the beginning of the cover of the gills, on each ſide, there is a crooked prickle. The colour of this fiſh is as diſagreeable as its form; being duſky, mixed with a dirty yellow: the belly is whitiſh. It uſually lies at the bottom of a ſtream, either on the gravel, or under a ſtone: it forms a hole in the gravel, where it depoſits its ſpawn, and quits it with great reluctance. It feeds on water inſects.

NATURAL HISTORY of the POGGE.

THIS fiſh ſeldom exceeds five inches and an half in length, and very ſeldom arrives even at that ſize: it has a triangular depreſſed head, which is about two inches broad, and very bony and rugged. The end of the noſe is armed with four ſhort upright ſpines, and on the throat are a number of ſhort white beards. The teeth are very minute, and ſituated in the jaws. The body, which is octagonal, is covered with a number of ſtrong bony cruſts, divided into ſeveral compartments; the ends of which project into a ſharp point. It is covered all over with bony ſcales, in the middle of each of which there is a hooked tubercle, which makes the fiſh appear full of angles. The Pogge is very common on moſt of the Britiſh coaſts.

NATURAL HISTORY of the FATHER LASHER.

THIS is alſo called the ſea-ſcorpion: it is no uncommon fiſh on the rocky coaſts of this iſland: it lurks under ſtones, and will take a bait. It ſeldom exceeds eight or nine inches in length, and its form reſembles that of a bull-head. Its head is very large, and has a moſt formidable appearance; being armed with large ſpines, which it can oppoſe to any enemy that attacks it; by ſwelling out its cheeks and gill covers to a very large ſize. The head is covered with prickles; the body is ſmall, and the belly broad and flat. Above the lateral lines on the back, there are four roughiſh broad tranſverſe ſpaces of a blackiſh colour; but the intermediate ſpaces are paler. The covers of the gills are connected below, appearing like a mantle thrown over its head and ſhoulders. The colour of the body is brown, or duſky and white marbled; and ſometimes it is ſtained with red: the belly is of a ſilvery white. The fins and tail are tranſparent, ſometimes clouded, and the rays are regularly barred with brown. The noſe, and the face, contiguous to the eyes, are furniſhed with ſhort ſharp ſpines: the covers of the gills are terminated by exceeding long ones, which are very ſtrong and ſharp-pointed. The mouth is large, and the jaws are covered with rows of very ſmall teeth; the roof of the mouth is furniſhed with a triangular ſpot of minute teeth. This ſpecies abounds in the Newfoundland ſeas; and on the coaſt of Greenland, in deep water near the ſhore. It is a principal food of the natives, and the ſoup made of it, is ſaid to be both agreeable and wholeſome. It will live a conſiderable time out of the water. Its food is ſhrimps, ſea inſects, and the young fry of fiſh.

NATURAL HISTORY of the DOREE, or GILT FISH.

IT has a broad compreſſed body, not much unlike that of a flounder; but it ſwims erect. The head is very large and compreſſed, and the mouth is extremely wide. The colour of the ſides is olive, with a large round black ſpot on each; by which it may be diſtinguiſhed from other fiſh of this kind. In ſhort, the form of this fiſh is hideous; the body is oval, the eyes large, and the irides yellow. The lateral line is very much diſtorted, ſinking at each end, and riſing near the middle of the back. The firſt dorſal fin conſiſts of ten ſtrong ſpiny rays, with long filaments reaching far beyond their ends. The ſecond, which is placed near the tail, conſiſts of twenty-four ſoft rays; the middlemoſt of which are the longeſt. The pectoral fins have fourteen rays, and the ventral ſeven: it has alſo two anal fins. The tail is round at the end, and conſiſts of fifteen branched rays. They never grow to a great ſize; one of the weight of twelve pounds being conſidered as a very large fiſh. It is called the Doree, or Gilt Fiſh, on account of its ſhining appearance when alive.

It was very long before this fiſh attracted our notice as an edible one: the vulgar prejudices on account of its deformity, deterred our anceſtors from venturing to eat it; but that judicious actor and bon vivant,

vivant, Mr. Quin, has effectually eſtabliſhed its reputation, and added a moſt delicious repaſt to our table.

This fiſh is found not only in the ſouthern ſeas of this kingdom, but alſo on the coaſt of Angleſea. Thoſe of the largeſt ſize are taken on the Bay of Biſcay, off the French coaſts: they are alſo very common in the Mediterranean.

Natural History of the HOLLIBUT.

THIS is the largeſt of all flat-fiſh in theſe parts of the world; it greatly exceeds a turbot in ſize, and is of a longer make. Some have been taken in our ſeas, weighing from one to three hundred pounds. In the ſeas of Newfoundland, Greenland, and Iceland, they are found much larger.

The Hollibut, with reſpect to its length, is the narroweſt of any of this genus, except the ſole. It is perfectly ſmooth and free from ſpines, either above or below. The colour of the upper part is duſky; that of the lower part of a pure white. The eyes are placed on the right ſide, or to the left of the mouth: the fins are at a greater diſtance from the head than in other flat fiſh. In both the upper and the lower jaws it has a double row of teeth, which are very ſharp, and ſomewhat crooked at the end. It has very ſharp prickles on the gills. It ſwims ſideways.

Of all flat fiſh the Hollibut is the moſt voracious. They are common in the London markets; where they are expoſed to ſale cut into large pieces. They are by ſome ſuppoſed equal to the turbot, but in general they are thought very coarſe eating; excepting the part which adheres to the ſide fins, which is extremely delicious.

Natural History of the PLAICE.

THE back of this fiſh is of a dirty olive colour, or brown, and ſpeckled with roundiſh red ſpots; of which there are ſome alſo on the fins. The belly is white. The eyes are on the right ſide, to the left of the mouth; and, at the upper edge of the coverings of the gills, there are ſeven bony tubercles, or warts; the fifth from the eyes being the higheſt and the largeſt. There is a row of teeth in each jaw, and a cluſter of teeth on the palate. One of the noſtrils is ſeated on the upper ſide, near the eyes; and the other on the lower ſide under the eyes. The tail is long, and roundiſh at the end.

Theſe fiſh are very flat. They are common on moſt of our coaſts, and are ſometimes taken of the weight of fifteen or ſixteen pounds: but they are very rarely found of that ſize, one of ſeven or eight pounds being reckoned a large fiſh. The largeſt are taken off Rye, on the coaſt of Suſſex, and alſo off the Dutch coaſts. They ſpawn about the beginning of February.

Natural History of the DAB.

THIS fiſh is ſomewhat thicker than the plaice, but ſmaller. It is found with the other ſpecies, but it is leſs common. The ſcales are ſmall and rough on the edges; in which it differs from the plaice, as well as in not having any tubercles near the head, nor red ſpots. But the eyes are ſituated like thoſe of the plaice; and the colour on the upper part is of a dirty olive, with a reddiſh caſt, and ſome ſpots of a duſky yellow. The mouth is of a middle ſize, and has a row of teeth in each jaw. The lateral line is very crooked at the beginning, but afterwards goes quite ſtraight to the tail. The lower part of the body is white. This fiſh is beſt in ſeaſon during the months of February, March, and April: they ſpawn in May and June, and remain flabby and watery all the reſt of the ſummer. They are ſuperior in goodneſs to both the plaice and flounder.

The SMEAR DAB.

It is about eighteen inches long and eleven wide, between fin and fin, on the wideſt part. The head appears very ſmall; the dorſal fin beginning very near its mouth, and extending almoſt to the tail. The eyes are very near each other, and the mouth is full of ſmall teeth. The back, which is covered with ſmall ſmooth ſcales, is of a light brown colour, ſpotted obſcurely with yellow. The belly is white, and marked with five large duſky ſpots. The fleſh of the Smear Dab is equal in goodneſs to that of the Common Dab.

Natural History of the FLOUNDER.

THE Flounder is eaſily diſtinguiſhed from the plaice, or any other fiſh of this genus, by a row of ſharp ſmall ſpines or prickles, that ſurrounds its upper ſides, and are placed juſt at the junction of the fins with the body. Another row marks the ſide-line, and runs half way down the back. The ſcales, which are exceeding ſmall, ſtick ſo cloſe to the ſkin, that there ſeems to be no roughneſs. This fiſh has a ſmall mouth, a narrow tongue, and a row of teeth in each jaw. It greatly reſembles the plaice in ſhape; but the body is ſomewhat longer and thicker. It inhabits every part of the Britiſh ſea, and even frequents our rivers which communicate with the ſea; and though it does not grow large in our freſh-water ſtreams, it is reckoned ſweeter than thoſe which live in the ocean. It does not grow ſo large as the plaice, and is hardly ever ſeen to exceed ſix pounds in weight. The colour of the upper part of the body is a pale brown, and frequently marked with a few obſcure ſpots of dirty yellow: the belly is white.

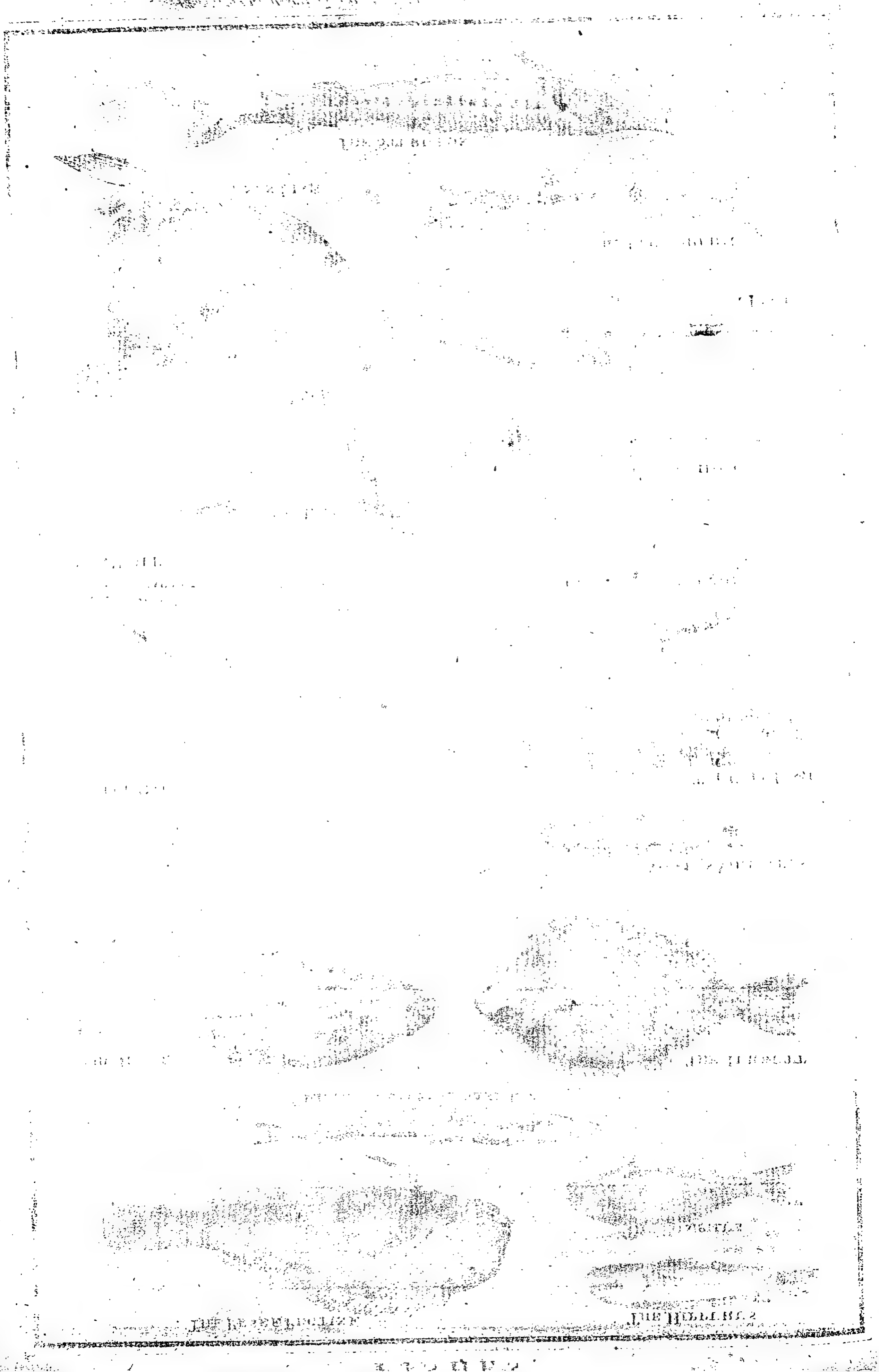
Flounders are in ſeaſon all the year, except in June and July, which is their time of ſpawning, and then they are ſick and flabby, and infeſted with worms which breed on their backs. The fleſh is white, ſoft, innocent, and nouriſhing; but it is always beſt when it is moſt firm. The taſte of it greatly reſembles that of the plaice, from which it differs but little in any reſpect.

It is the nature of all flat fiſh to lie and feed at the bottom; ſome indeed are fond of mud, but the Flounders avoid it as much as poſſible, delighting to lie on ſandy or gravelly bottoms, eſpecially on the declivity of a deep hole, near a bank, and in an eddy.

They may be angled for either with a float or a running bullet, but the latter is preferable. The bullet ſhould reſt at leaſt a foot from the hook, that the bait may be at liberty to be put in motion by the water. If you uſe a float, let it lie flat on the water, and when you perceive it to move along ſlowly, and ſoon after become upright, then ſtrike, and you will be ſure of your prey. But always remember, that he is ſome time in ſucking the bait into his mouth before he gorges it.

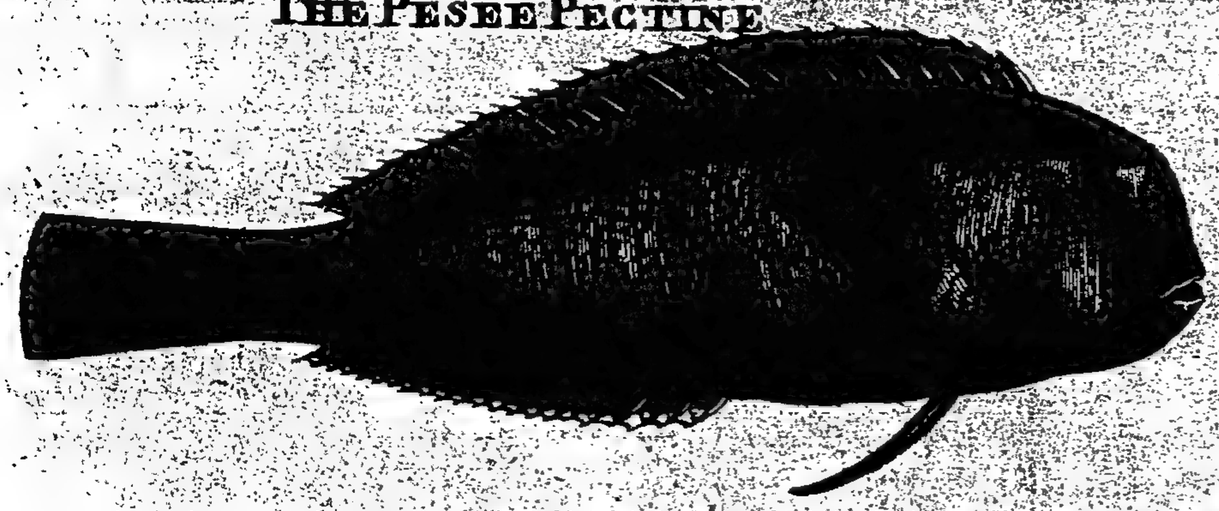
The beſt baits are red worms, or very ſmall marſh worms put on a ſmall hook. You ſhould bait the ground with a handful of ſmall red worms cut in two pieces. They may be angled for all the day, but early in the morning is the beſt time. He likewiſe takes earth bobs very well.

In the hot months, there are great quantities caught with the fluke-rake. The method is to get one



FISHES.

THE PESEE PECTINE

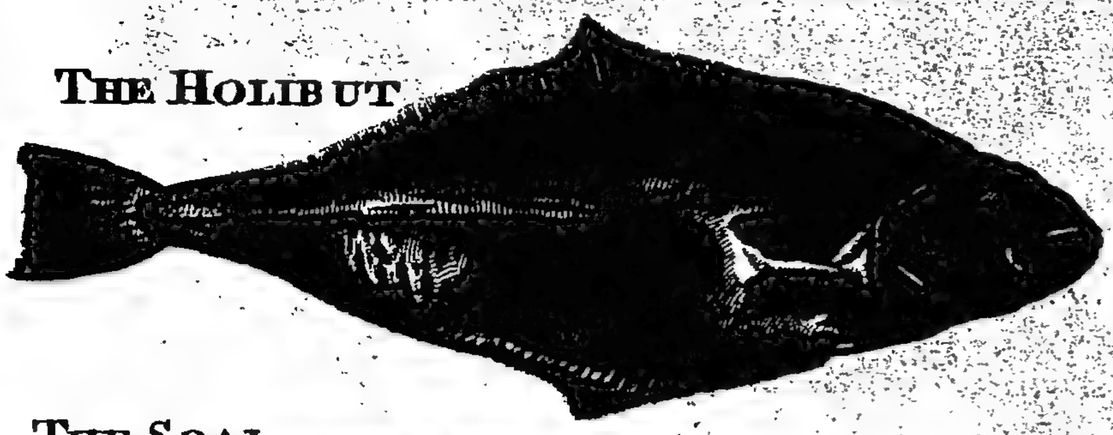


THE HIPPURUS

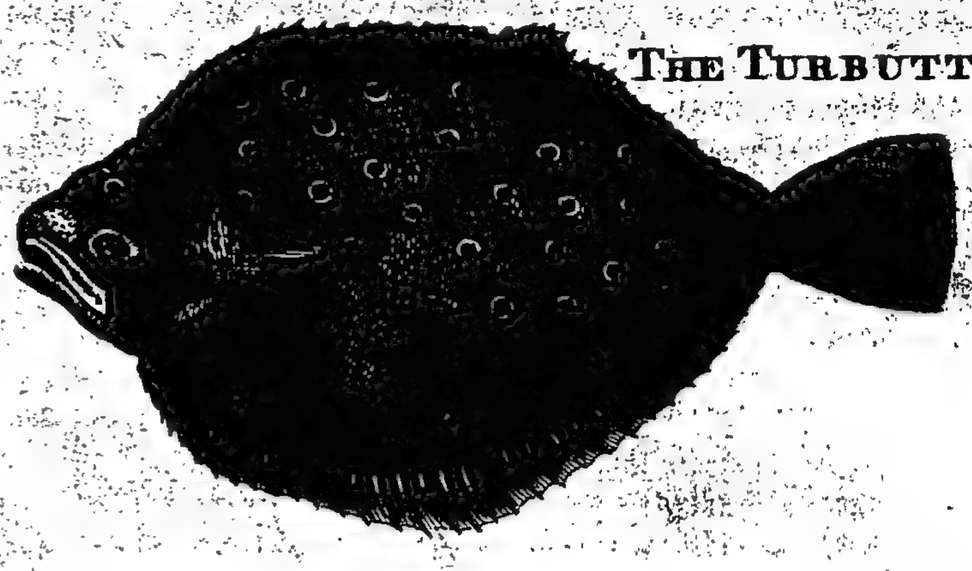
THE POMPILUS

THE AMMODITES or SAND EEL

THE HOLIBUT



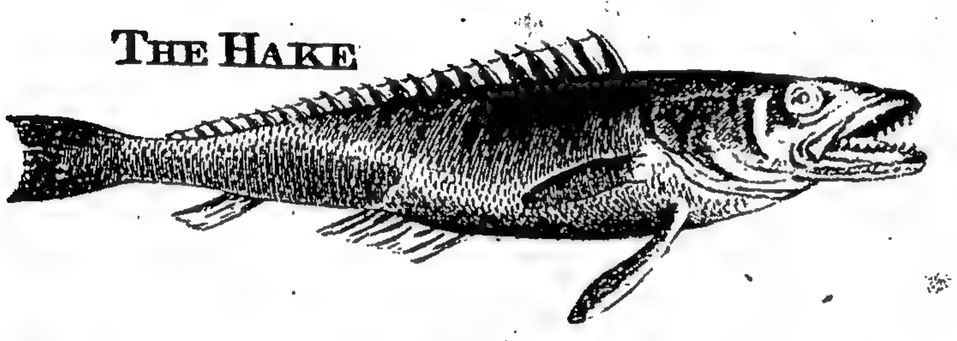
THE TURBUTT



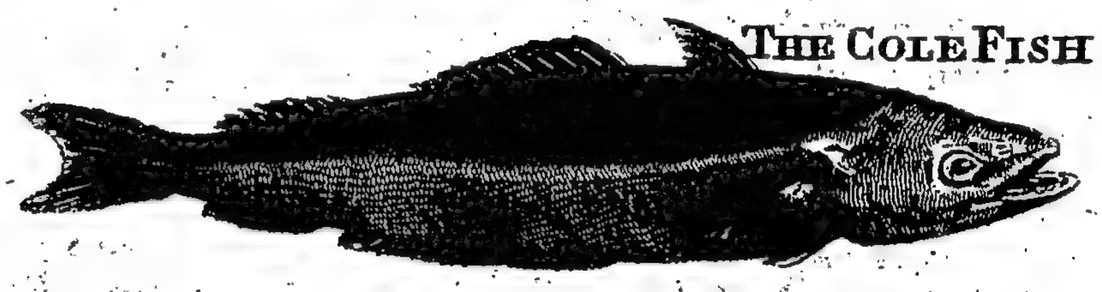
THE SOAL

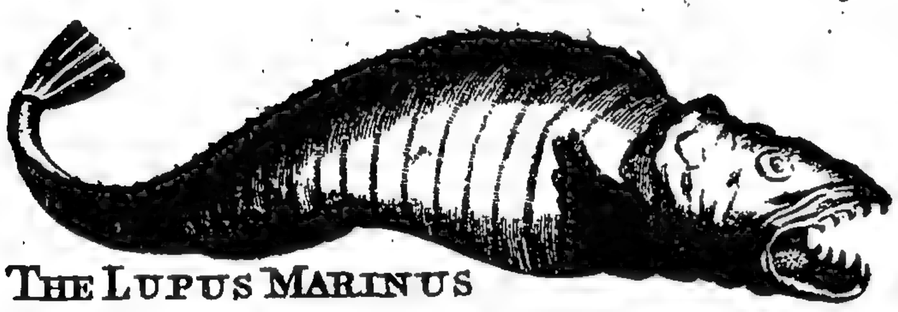
ASELLUS VIRESCENS

THE HAKE



THE COLE FISH



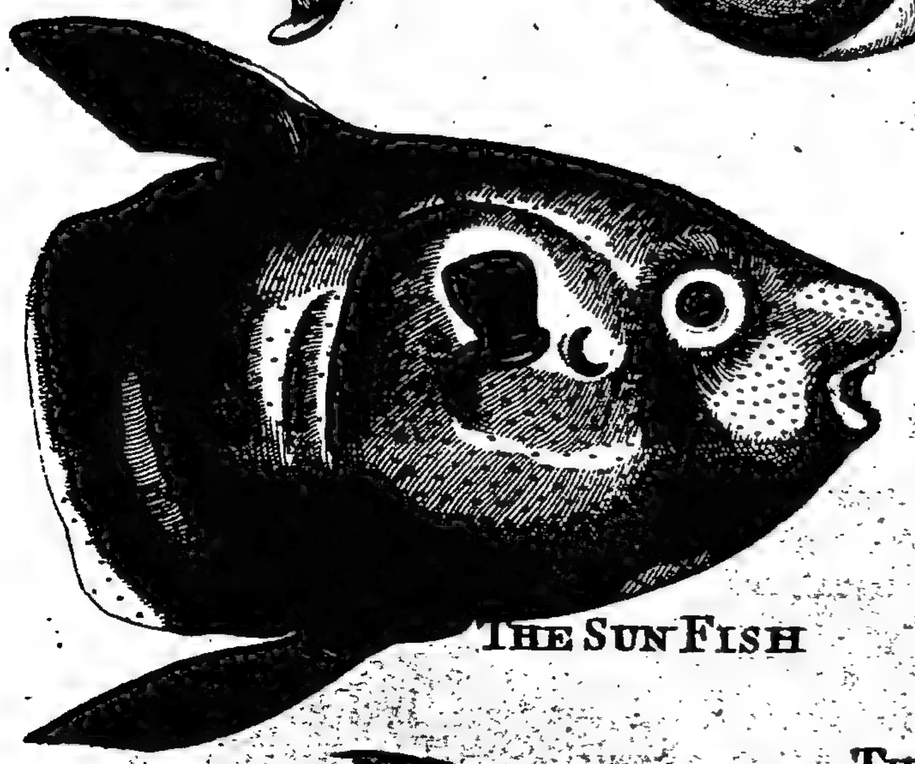


THE LUPUS MARINUS
or SEA WOLF

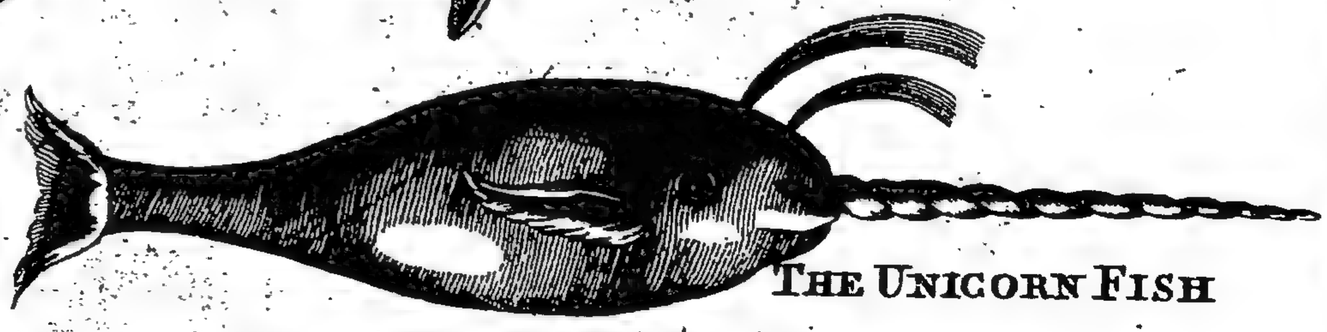
THE SEA GUDGEON

THE EEL

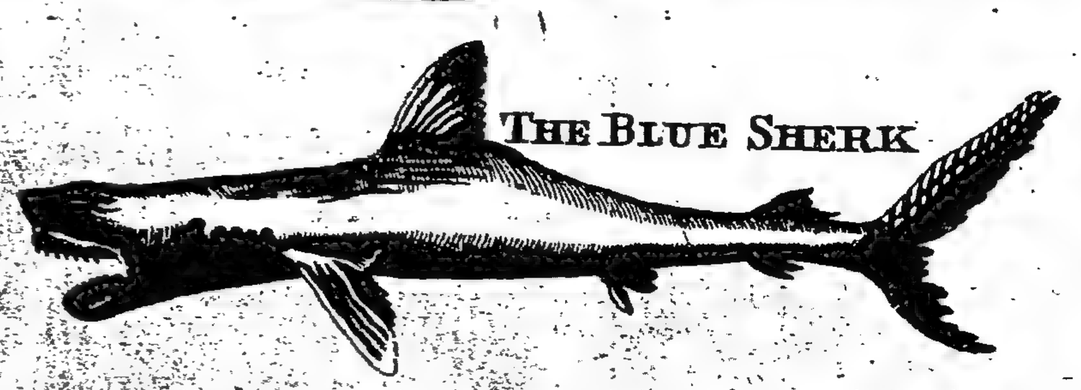
THE OPHIDION



THE UNICORN FISH



THE BLUE SHERK



THE SUN FISH

THE STURGEON

Published by Alex.r Hogg at the Kings Arms N.o 16 Paternoster Row.

Myles sculp.

one about two yards long, and go to the ſhallow parts of the water where it is the moſt ſandy, and as you go along, keep thruſting the rake into the ſand, which you may eaſily do by ſetting one foot upon the frame, and when you have caught one you will eaſily perceive it by the rake's graſhing as the forks enter his back. This method is only uſed in the tide's way after it is gone down.

Natural History of the SOLE.

THIS is a longiſh flat fiſh, reſembling the ſole of a ſhoe in ſhape, from whence it has its name. It is found on all our coaſts, but thoſe on the weſtern ſhores are much ſuperior in ſize to thoſe of the north. On the weſtern coaſts they are ſometimes taken of the weight of five or ſix pounds; but towards Scarborough they ſeldom exceed one pound; and one of two pounds is reckoned an uncommon fiſh. The upper part is of a dark aſh colour, and the lower part white: it is covered with rough ſcales. The lateral line paſſes directly from the head to the tail, thro' the middle of both ſides. The corners of the mouth are rough, having a kind of ſmall briſtles or hairs: the body is ſurrounded with ſhort fins, which begin near the eyes, and extend almoſt to the tail. The eyes are ſmall, round, and covered with a looſe ſkin: the irides are yellow, and the pupils of the eye are of a bright ſappharine colour: the tail is rounded at the end.

The Sole is a fiſh of a very delicate flavour; but the large Soles are much inferior in goodneſs to the ſmall ones. The chief fiſhery for them is at Blixham, and in Torbay. About twelve or fourteen years ago, Mr. Blake, a gentleman of great probity and fortune, took indefatigable pains to reduce the price of this delicious fiſh, by contriving a method of bringing them to London by land-carriage; and though his ſcheme did not meet with that ſucceſs it merited, and was oppoſed by the whole trade of mercenary fiſhmongers, yet the plan appears now to be in a great meaſure adopted by the fiſhmongers themſelves; and Soles are now to be purchaſed of them at about half the price they were uſually ſold at, before Mr. Blake projected his plan.

By the antient laws of the Cinque Ports, a penalty was inflicted upon every perſon who ſhould take Soles from the firſt of November to the fifteenth of March; alſo upon every perſon who ſhould fiſh for them from ſun-ſetting to ſun-riſing.

There is a ſpecies called the ſmooth Sole, which is very ſcarce, and found chiefly about Cornwall. It is extremely thin, white, and tranſparent; and, on that account, is ſometimes called the Lantern Fiſh.

Natural History of the TURBOT.

IN the northern part of England this fiſh is called a Brett: it grows to a very large ſize; and ſometimes, though very rarely, is found to weigh thirty pounds. It is the largeſt of all this kind, the hollibut excepted. Theſe fiſh are taken chiefly off the north coaſt of England, and others off the Dutch coaſt; but we believe the laſt has, in many inſtances, more credit than it deſerves for the abundance of its fiſh. They have no ſcales, but a rough ſpotted ſkin, full of exceeding ſmall prickles, placed without order on the upper part of the body.

The large Turbots, and ſeveral other kinds of flat fiſh, are taken by the hook and line, for they lie in deep water: the method of taking them in wares, or ſtaked nets, is too precarious to be depended on for the ſupply of our great markets, becauſe it is by meer accident that the great fiſh ſtray into them.

Mr. Pennant furniſhes us with the following method of fiſhing for Turbot, cod, ling, ſcates, &c. The inhabitants of many of our fiſhing coaſts, ſays he, eſpecially thoſe of the north part of North Wales, are unacquainted with the moſt ſucceſsful means of capture: for their benefit, and perhaps that of other parts of our iſland, we ſhall lay before them the method practiſed by the fiſhermen of Scarborough.

When they go out to fiſh, each perſon is provided with three lines. Each man's lines are fairly coiled upon a flat piece of wicker work; the hooks being baited, and placed very regularly in the center of the coil. Each line is furniſhed with fourteen ſcore of hooks, at the diſtance of ſix feet two inches from each other. The hooks are faſtened to the lines upon ſneads of twiſted horſe hair, twenty-ſeven inches in length.

When fiſhing there are always three men in each coble, and conſequently nine of theſe lines are faſtened together, and uſed as one line, extending in length near three miles, and furniſhed with two thouſand five hundred and twenty hooks. An anchor and a buoy are fixed at the firſt end of the line, and one more of each at the end of each man's lines; in all four anchors, which are commonly perforated ſtones, and four buoys made of leather or cork. The line is always laid acroſs the current. The tides of flood and ebb continue an equal time upon our coaſt, and when undiſturbed by winds run each way about ſix hours. They are ſo rapid, that the fiſhermen can only ſhoot and haul their lines at the turn of tide; and therefore the lines always remain upon the ground about ſix hours. The ſame rapidity of tide prevents their uſing hand-lines; and therefore two of the people commonly wrap themſelves in the ſail, and ſleep while the other keeps a ſtrict look out, for fear of being run down by ſhips, and to obſerve the weather. For ſtorms often riſe ſo ſuddenly, that it is with extreme difficulty they can ſometimes eſcape to the ſhore, leaving their lines behind.

The coble is twenty feet ſix inches long, and five feet its extreme breadth. It is about one ton burthen, rowed with three pair of oars, and admirably conſtructed for the purpoſe of encountering a mountainous ſea: they hoiſt ſail when the wind ſuits.

The five men boat is forty feet long and fifteen broad, and of twenty-five tons burthen; it is ſo called, though navigated by ſix men and a boy, becauſe one of the men is commonly hired to cook, &c. and does not ſhare in the profits with the other five. All our able fiſhermen go in theſe boats to the herring-fiſhery at Yarmouth the latter end of September, and return about the middle of November. The boats are then laid up until the beginning of Lent, at which time they go off in them to the edge of the Dogger, and other places, to fiſh for Turbot, cod, ling, ſcates, &c. They always take two cobles on board, and when they come upon their ground, anchor the boat, throw out the cobles, and fiſh in the ſame manner as thoſe who do go from the ſhore in a coble, with this difference only; that here each man is provided with double the quantity of lines, and inſtead of waiting the return of tide in the coble, return to the boat and bait their other lines; thus hawling one ſet, and ſhooting another every turn of tide. They commonly run into harbour twice a week to deliver their fiſh. The five-men boat is decked at each end, but open in the middle, and has two large lug ſails.

The beſt baits for all kinds of fiſh is freſh herring cut in pieces of a proper ſize; and, notwithſtanding what has been ſaid to the contrary, they are taken here at any time in the winter, and all the

ſpring, whenever the fiſhermen put down their nets for that purpoſe. The five-men boats always take ſome nets for that end. Next to herrings are the leſſer lampreys, which come all winter by land-carriage from Tadcaſter. The next baits in eſteem are ſmall haddocks cut in pieces, ſand-worms, muſcles, and limpets (called here fleddets,) and laſtly, when none of theſe can be had, they uſe bullock's liver. The hooks uſed here are much ſmaller than thoſe employed at Iceland and Newfoundland. Experience has ſhewn, that the larger fiſh will take a living ſmall one upon the hook, ſooner than any bait that can be put on; therefore they uſe ſuch as the ſmall fiſh can ſwallow. The hooks are two inches and an half long in the ſhank, and near an inch wide between the ſhank and the point. The line is made of ſmall cording, and is always tanned before it is uſed.

Turbots, and all the rays, are extremely delicate in their choice of baits. If a piece of herring or haddock has been twelve hours out of the ſea, and then uſed as bait, they will not touch it.

Such is the manner of fiſhing for thoſe fiſh that uſually keep near the bottom on the coaſts of England; and Duhamel obſerves, that the beſt weather for ſucceeding, is half calm, when the waves are juſt curled with a ſilent breeze.

CHAP. IV.

Containing the NATURAL HISTORY *of the* PEARL, *the* GILT HEAD, *the* SEA BREAM, *the* OPAH, *the* WRASSE, *the* COOK, *the* PEARCH, *the* BASS, *the* RUFF, *the* STICKLEBACK, *the* MACKREL, *the* TUNNY, *the* SCAD, *the* GURNARD, *the* PIPER, *the* TUB FISH, *the* LOACH, *the* SALMON, *the* GREY, *the* SALMON TROUT, *the* TROUT, *the* SAMLET, *the* CHAAR, *the* GRAYLING, *the* SMELT. *the* GUINIAD, *the* PIKE, *the* ARGENTINE, *and the* MULLET.

NATURAL HISTORY of the PEARL.

THE Pearl differs from others of this kind, in having a ſcaly body, and from a place in the prickles, which ſurround the roots of the fins. The upper part of the body is of a deep brown, marked with ſpots of dirty yellow: the lower part is of a pure white. Its eyes are on the left ſide, to the right of the mouth, and are at a greater diſtance from each other than thoſe of the plaice. Theſe fiſh are frequently brought to the London markets, but they are ſmaller than the turbot, and inferior in goodneſs.

NATURAL HISTORY of the GILT-HEAD, or GILT-POLL.

IT is a broad fiſh, compreſſed on the ſides, and ſomewhat reſembling a bream. It grows to the length of eight or ten inches, and to the weight of ten pounds. The back is ſharp, and of a duſky green colour. Between the eyes is an arched ſtripe, reſembling a creſcent, of a gold colour; the horns of which point towards the head; and from this ſemilunar gold coloured ſpot, the Gilt-Head takes its name. It has uſually a black ſpot at the upper corner of the cover of the gills, and another of a purple colour below them. The teeth in each jaw are oblong and roundiſh. The tail is very much forked.

This is one of thoſe fiſh that haunt deep waters on bold rocky ſhores: it feeds principally on ſhell-fiſh, which it comminutes with its teeth before it ſwallows. It is frequently ſeen in the markets of Rome, Genoa, and Venice; and is ſometimes taken on our coaſts. It is but a coarſe fiſh; and was held in very little eſteem by the Romans, except it had fed on the Lucrine oyſter.

No praiſe no price a gilt-head e'er will take,
Unfed with oyſters of the Lucrine Lake.
MARTIAL, lib. iii. ep. 90.

The SEA BREAM.

This ſpecies grows to a ſize equal to that of the gilt-head: its form and the figure of the teeth are alſo much the ſame. The upper part of the body is black, the ſides are of a lighter colour, and the belly is of a ſilver white. The eyes are large, and the covers of the gills reſemble thoſe of a ſalmon. It has only one fin on the middle of the back, which extends its whole length; and another fin, at the bottom of the belly, reaches almoſt from the vent to the tail. The ſcales are very large, and the tail is forked. This fiſh is not very common in England; the fleſh of it cuts red, and has a very delicate taſte, far ſurpaſſing either the river or the pond Bream. It is frequently caught in rock-fiſhing, and by the ſalmon fiſhermen in the Merſey.

There is a variety of the Sea Bream, whoſe body is entirely red.

NATURAL HISTORY of the OPAH.

THE Opah is a beautiful, and an uncommon fiſh, weighing about ſeventy or eighty pounds, and ſomewhat like the ſea-bream in ſhape. The length is about three feet and an half; the breadth from back to belly almoſt two feet; and the thickneſs, from ſide to ſide, does not exceed ſix inches. In proportion to the ſize of the fiſh, the mouth is ſmall, forming a ſquare opening, and the jaws deſtitute of teeth. The tongue is rough, and thick ſet with beards or prickles, pointing backwards, ſo that any thing may paſs down, but cannot eaſily return back. The eyes are very large, covered with a membrane, and ſhining with a glare of gold. The body diminiſhes very ſmall to the tail, which is forked, and expands twelve inches. The fins and tail of this fiſh are of a fine ſcarlet; but the reſt of the body is beautiful beyond deſcription. It is ſmooth, and covered with almoſt imperceptible ſcales. The colour of the upper part is a kind of bright green, variegated with whitiſh ſpots, and enriched with a ſhining golden hue, reſembling, in a great degree, the ſplendour of the peacock's feathers; this gradually vaniſhes in a bright ſilver colour; and the gold begins again to predominate near the belly, in a lighter ground than on the back.

NATURAL HISTORY of the WRASSE, or OLD WIFE,

THE ſhape of this fiſh reſembles that of the river tench; it grows to the weight of four or five pounds, and is covered with large ſcales.

These fish vary infinitely in colour; but in general are reddish, and most beautifully striped, especially about the head, with the richest colours, such as red, blue, and yellow. We must not therefore multiply the species from these accidental teints, but particularly attend to the form which never alters. The snout is oblong, and turns upwards; the lips are thick and fleshy, projecting beyond the jaws; but the mouth is small. The teeth in the jaws are serrated, but not very sharp. The tail is rounded at the end, and is formed of fourteen soft branching rays.

This species is found in deep water, adjacent to the rocks, and is to be met with in the British and Irish seas. It is more agreeable to the sight than to the taste. The Welch call it gurach, or the old woman; the French call it la veille, or the old woman; and the English give it the name of Old Wife. It is difficult to assign a reason why they all so exactly agree in these synonims.

The LESSER GREEN WRASSE.

The body of this species is entirely green, except that some of them have bluish spots about the belly; and the body is broader and thicker than that of others of this kind. The fins are somewhat spotted, and it has a purple tubercle near the vent. The painted Wrasse, the black Wrasse, the striped Wrasse, and the variegated Wrasse, are varieties of this species.

Natural History of the COOK.

THIS is a scaly fish, and does not grow to any great size. The back is purple and dark blue, and the belly, yellow. They are sometimes taken in great plenty on the Cornish coasts.

Natural History of the PEARCH.

THE Pearch was much esteemed by the Romans, and is now equally admired as a firm and delicate fish; and the Dutch are particularly fond of it when made into a dish called water souchy. This fish delights in deep holes, and gentle streams: it is extremely voracious, and a very eager biter: if an angler meets with a shoal of them, he is almost sure of taking every one. A full-grown Pearch is about twelve or fourteen inches long, tho' they are sometimes found to exceed sixteen; but this is an extraordinary size. The body is deep, the scales very rough, and the back very much arched. The iris of the eye is of a yellow or gold colour; the mouth is wide; and the teeth are small, disposed in the jaws and on the roof of the mouth: the edges of the covers of the gills are serrated; and on the lower end of the largest is a sharp spine. The colours of the Pearch are beautiful: the back and part of the sides are of a dark green, marked with five broad black bars, pointing downwards: the belly is white, tinged with red: the ventral fins are of a bright scarlet; and the anal fins and the tail are of the same colour, but somewhat paler. The tail is a little forked.

It is said, that the pike will not attack this fish, being fearful of the spiny fins which the Pearch erects at the approach of the former. With respect to large fish, this opinion may be well founded; but it is well known the small ones are the most alluring bait that can be offered for the pike: it is probable the fins are then too soft to do him any injury.

The Pearch is very tenacious of life, and may be carried forty or fifty miles in dry straw, and yet survive the journey. The flesh of it is very wholesome, and easy of digestion. The bones of the head are used in medicine, and, when pulverized, have the same virtue as other absorbent powders.

There is a very singular variety of Pearch in a lake called Llyn Raithlyn, in Merionethshire, in which the lower part of the back-bone, next the tail, is strangely distorted.

The liver of the Pearch is usually thrown away, because it is apt to be measly. These fish spawn but once a year, and that is in the latter end of February. Some think the male is to be distinguished from the female, by the fins being of a deeper red.

The most natural places for this fish are rivers, and yet it will live and even thrive when shut up in a pond. In the day-time it does not appear to be fond of any particular haunt, because it is almost continually roving about in quest of food, being, as already observed, a very voracious fish; and yet they are more likely to be found under the hollow of a bank, the piles of bridges, stumps of trees, or in a gentle stream of a middling depth. In the night, indeed, they retire to a place of repose, which, if you are so lucky as to discover, early in the morning, you have an excellent chance of taking them all, for they bite very boldly, generally herd together, and the taking of one does not intimidate the rest from falling into the same danger.

It will be to no purpose to angle for this fish before the mulberry-tree begins to bud; that is, before the spring is so far advanced as to put the fruit out of danger of being killed by nipping frosts, and for the same reason he always bites best in warm weather; yet, in the midst of summer, he is soonest taken in cool, cloudy, and windy weather, and you may angle for him any time of the day, but you will be more likely to succeed from seven to ten in the morning, and from two till sun-set in the afternoon, or later. In angling for Pearch, you need not continue long in the same place, for they usually bite as soon as the bait drops in: you ought to angle at or near the bottom, constantly raising your bait almost to the top, letting it drop gently again. The dog or flag-worm is an excellent bait.

The most likely baits are worms, minnows, and small frogs; but the most sure killing is the brandling-worm, two upon the hook at a time, well scoured in moss, unless it be in the Mole, and some other rivers that run into the Thames, where minnows are scarce. But they are not very nice in the choice of their feed, and have frequently been caught with a fly in fishing for trout; and sometimes a brace at a time have been caught in angling for gudgeons with two hooks baited with red worms. They will take their own gills very well. They take the bait best within a foot of the ground, and swallow it instantly, because they have the largest mouth, in proportion to their size, of any other fish. However, when you fish with a minnow, or frog, they should have a little more time when you strike, than when you bait with a worm.

The Pearch struggles hard for his life, and consequently yields the angler much diversion: when a Pearch is pursued by the pike, he sets up his prickly fins, and often saves himself from being swallowed. If you find that you have a bite from a large one, give him a little time to gorge the bait; but if it is a small one, you may strike instantly, especially if your bait be a brandling. He will bite at a worm, a minnow, or a little frog; of which you may find many in hay-time: of worms, the lob-worm, or the brandling, is taken to be the best, being well scoured in moss or fennel; and the worm that lies under cow-dung, with a bluish tail. He will also take the red-worm, and the dew-worm.

When the Pearch bites, be sure you give him time enough to pouch the hook, for scarce any angler ever gave him too much. Some, in angling for

Pearch, will ſuffer their bait to touch the ground, eſpecially when they fiſh with a worm. The turning of the water, or eddy, in a good gravel-ſcour, is an excellent place for ſport. Your tackle ſhould be ſtrong, becauſe, in fiſhing for Pearch, pikes are often taken. Bait the ground over night with lob-worms cut in pieces.

The following directions in angling for Pearch with a worm, may be worth obſerving. In March uſe the red-worm at the bottom. In April the oak-worm, a young frog with its feet cut off, or a red-ſnail. In May the dock-worm, or the bait that breeds on the oſier-leaf, the oak-leaf, and the hawthorn. In June the red-worm with the head cut off, and a cod-bait put before it, or the dor. In July, the large graſs-hopper, or dunghill-grub: in Auguſt, and the following months, red-worms, or brandlings; at any time two or three gentles.

The Pearch has been often fiſhed for with two hooks and a live minnow with good ſucceſs. The hooks have been tied to ſilk, one of which is put through the upper jaw, and the other through the middle of the back. When you bait with a frog, thruſt the hook through its leg near the thigh, and when you throw it into the water, keep it from the ſhore as much as poſſible, for it will be for making thither as faſt as it can.

As the Pearch generally ſwallows the bait, and as it is difficult to get the hook out of his entrails without breaking the line, it will be neceſſary to carry an inſtrument in your pocket, which is called a gorge. It may be made of iron, or wood, about ſix inches long, and half an inch thick, with a hollow at the extremity. This hollow end you are to thruſt down the throat of the fiſh, till you feel the hook, at the ſame time keeping your line ſtraight, leſt the hook ſhould catch again; when you have diſengaged it with this inſtrument, you may draw them both out carefully together.

Auſonius, ſays Lemery, reckons the Pearch of the number of thoſe fiſhes that have a delicious taſte. It may be ſaid, in general, that the Pearch has but few groſs humours; that it produces many good effects, and but a few bad ones: and the reaſon is, becauſe this fiſh lives generally, and out of choice, in pure, clear, and rapid waters, rather than in thoſe that are muddy, and run ſlowly. Moreover, it feeds upon good food, and is very active, which, alſo, contributes to make it more delicious and wholeſome. It is nouriſhing, and affords good food, becauſe it contains many balſamic parts, and moſt pure juice. It is, alſo, eaſy of digeſtion, when middle-aged; for then it is of a middling conſiſtence: when, on the contrary, it is too young, or too old, it is ſoft and viſcous, or elſe hard, like leather.

NATURAL HISTORY of the BASS.

THE Baſs is a ſtrong, active, and voracious fiſh: it is frequently called the wolf-fiſh, on account of its voracity. It will grow to the weight of fifteen pounds, and its ſhape reſembles that of a trout, except that it has a thicker head. The mouth is large: the teeth, which are ſituated in the jaws, are very ſmall. In the roof of the mouth is a triangular rough ſpace, and near the gullet there are two others of a roundiſh form. The ſcales are of a middling ſize, thick ſet, and adhere cloſely to the ſkin. It has thorns or prickles about its head; and the eyes are large, with an iris of a ſilver colour. The back is duſky, tinged with blue, and the belly is white. In young fiſh, the ſpace above the ſide-line is marked with ſmall black ſpots, which gradually diſappear as it advances. The Baſs is eſteemed a very delicate fiſh, and extremely wholeſome. It is an inhabitant of the ſea, and has never been found in our freſh-water ſtreams.

NATURAL HISTORY of the RUFF.

THIS fiſh reſembles the pearch, but is ſlenderer and ſmaller, ſeldom exceeding ſix inches in length: the body is covered with rough compact ſcales, from whence it has its Engliſh name. The back and ſides are of a dirty green, the latter inclining to yellow; but both ſpotted with black: About the covers of the gills it is of a ſhining gold colour; whence it is ſometimes called the gilded pearch. It is gregarious, aſſembling in large ſhoals, and keeping in the deepeſt part of the water. The firſt rays of the dorſal fin, like thoſe of the pearch, are ſtrong, ſharp, and ſpiny; the other ſoft. The Ruff is a river fiſh.

NATURAL HISTORY of the STICKLEBACK.

THESE are common in many of our rivers, and are found in vaſt quantities in the Fens of Lincolnſhire, and ſome of the rivers that creep out of them. Once in ſeven or eight years, ſuch amazing quantities are found in the Welland, near Spalding, that they are uſed to manure the land. We are credibly informed, that a man employed by a farmer, got near four ſhillings a day, for a conſiderable time, by ſelling them at an halfpenny per buſhel. They are ſuppoſed to be the multitudes that have been waſhed out of the Fens by the floods of ſeveral years, and collected in ſome deep hole, till, overcharged with numbers, they are periodically obliged to attempt a change of place. This fiſh has only one fin on the back, with three diſtinct ſpines or prickles placed before it, which it can raiſe or depreſs at pleaſure: the eyes are large, the belly prominent. The mouth is furniſhed with very ſmall teeth; and the upper jaw is ſomewhat longer than the lower. The tail conſiſts of twelve rays, and is even at the end. The colour of the back and ſides is an olive green, and that of the belly is white.

There is a ſpecies of the Stickleback which has ten ſpines or prickles, and is a ſmaller fiſh than the above; and another that has fifteen ſpines, which grows to the length of ſix inches. The latter inhabits the ſea, and is ſometimes called the Sea Stickleback.

NATURAL HISTORY of the MACKREL.

THE Mackrel was greatly eſteemed by the Romans, becauſe it furniſhed the precious *garum*, a kind of pickle that gave a high reliſh to their ſauces. It is a ſummer fiſh of paſſage that viſits the Britiſh coaſts in immenſe ſhoals. It is uſually from a foot, to a foot and an half in length, and ſeldom exceeds two pounds in weight.

The Mackrel is a moſt beautiful fiſh when alive, as nothing can exceed its brilliancy of colour; but it is greatly impaired by death, though it continues to merit the appellation of a beautiful fiſh. The body is long, thick, and fleſhy, but very ſmall and ſlender towards the tail. It is not entirely deſtitute of ſcales, but what it has are extremely thin and ſmall. The colour of the back and ſides is a fine green, varied with blue, marked with black lines, pointing downwards; beneath the line, the ſides and belly are of a ſilvery colour: the tail is broad and forked, and appears to be almoſt ſeparated into two diſtinct fins. The noſe is taper and ſharp-pointed; the jaws are of an equal length, and furniſhed with teeth, which are ſmall and numerous:

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the eyes are large, the tongue ſharp, and the noſtrils ſmall and round. It is a fiſh of prey. When juſt taken, the fleſh of a Mackrel is delicate food, and it is eſteemed even after it is brought up to London. Thoſe who have taſted Mackrel perfectly freſh, know how much they are ſuperior to thoſe which have been taken two or three days.

They have a method in Cornwall of pickling and ſalting Mackrel, where it proves a great relief to the poor during winter. They are recommended for the jaundice, and obſtructions of the liver. This fiſh is much uſed in England, but, as we have already obſerved, only for a certain ſeaſon of the year, after which it diſappears; but in ſome countries they have it at all ſeaſons.

It is nouriſhing food, and reckoned to be of a diſſolving nature; but is heating, and not reckoned wholeſome, producing viſcous and groſs juices, and is not eaſy of digeſtion. It contains much oil, volatile ſalt, and phlegm. Bellonius blames thoſe who boil a Mackrel, and ſays it ſhould be roaſted, and ſeaſoned with ſuch things as promote digeſtion. The roaſting certainly diveſts it more of its viſcous and groſs juices. It agrees, in ſpring and ſummer, with young people of a healthy conſtitution, who have a good ſtomach.

Mackrel are found in large ſhoals in many parts of the ocean, but eſpecially on the coaſts of France and England. They enter the Engliſh channel in April, and take their courſe through the ſtreights of Dover, inſomuch that in June they advance as far as Cornwall, Suſſex, Kent, Normandy, and Picardy.

They are taken either with the angle or with nets. When they are angled for, it muſt be out of a boat, or ſmack, or a ſhip that lies at anchor. The beſt bait for them is a bit of herring put upon a ſtrong hook; but when this is wanting, a ſhrimp, or a bit of any other fiſh will do, or even a piece of ſcarlet cloth; for they bite ſo freely, there is almoſt a certainty of having ſport: when you have taken one, a bit of their own fleſh will ſerve for a bait. There is no occaſion to be curious about your tackle, for you may even fiſh without a rod, and with ſeveral hooks at a time. In the Weſt of England they fiſh for them with nets, near the ſhore, in the following manner: one man fixes a pole into the ſand, near the ſea, to which he faſtens one end of a long net. Another in a boat takes the other end of the net in his boat, and rows round in a circuit as far as the length of the net will permit, and then back towards the ſhore; when his boat turns round he ſteps into the water, and taking the cord of the net with him, drags the net towards the ſhore; then upon a ſignal given, both the men draw the net out of the ſea, and by this method often catch three or four hundred fiſh; they are immediately carried away by horſes, which wait for that purpoſe. The quantity of Mackrel ſometimes taken upon that coaſt is almoſt incredible; and then they are ſo cheap, that they are not worth carrying away.

The fleſh of a Mackrel is very good when freſh, eſpecially if they are dreſſed when juſt taken out of the water, and there is ſuch a difference between them and thoſe that are brought to London, that it is not to be conceived by any that have not tried. However, they are not to be deſpiſed, even when they are well cured by pickling, and put up into barrels.

There are two ways of pickling them; the firſt is, by opening and gutting them, and filling their bellies with ſalt, cramming it as hard in as poſſible with a ſtick; which done, they range them in ſtrata, or rows, at the bottom of the veſſel, ſtrewing ſalt between the layers. In the ſecond method, they put them immediately into tubs of brine, made of freſh water and ſalt, and let them ſteep ſo long, till they think they have imbibed ſalt enough to make them keep; after this, they take them out and barrel them up, taking care to preſs them down as cloſe as poſſible.

Natural History of the TUNNY.

THIS is alſo called the Spaniſh mackrel. The form of the Tunny, however, is leſs elegant than that of the mackrel, being rather thicker in the middle. The colour of the upper part of the body is duſky, varied with blue and green, and the ſides and belly are ſilvery. They grow to a large ſize, ſometimes being found of upwards of a hundred weight. They are fiſh of paſſage, and ramble from one part of the ſea to another, at a conſiderable diſtance. In the months of September and October they quit the ocean, and paſs through the ſtrait of Gibralter, into the Mediterranean ſea, towards the Levant. They make a great article of proviſion in the adjacent kingdoms. Amazing quantities of them are taken in nets, for they come in vaſt ſhoals, keeping along the ſhores. They are not common in our ſeas, but are ſometimes taken on the coaſt of Cornwall, with their ſtomachs full of pilchards. The fleſh of the Tunny, though not very delicate, is ſaid to be tolerable food when properly cooked.

Natural History of the SCAD.

THIS is called the horſe-mackrel by the inhabitants of London: it reſembles the common mackrel in colour, ſhape, and flavour; but it is ſmaller, and the body is thinner. The head, and the upper part of the body are varied with green and blue, and the belly is ſilvery. The ſcales are very large and thin: the lower half of the body is quadrangular, and marked on each ſide with a row of thick ſtrong ſcales, prominent in the middle, and extending to the tail. It is taken on the coaſt of Cornwall, and many other places.

Natural History of the GREY GURNARD.

THE colour of the back and tail of this fiſh is of a deep grey, covered with ſmall ſcales, and ſpotted with yellow or white. The head is very large, covered with bony plates which have prickles on them. The ſnout terminates in two horns; the mouth is large; and the jaws, the roof of the mouth, and the baſe of the tongue, are armed with very ſmall rough teeth. The body gradually becomes ſmaller from the head to the tail, and it has a furrow in the middle of the back, armed on both ſides with a row of bony thorns, from which the fins ariſe. The fleſh of the Grey Gurnard is firm, and has a good flavour.

The red Gurnard, or rocket, reſembles the former, but differs in ſize, ſeldom exceeding twelve inches in length: the head is leſs; the body and fins are more red, and the covers of the gills are engraved with ſtreaks or rays, proceeding, as it were, from a center.

Natural History of the PIPER.

THE Piper is of the ſame colour as the red Gurnard, except that it has a yellowiſh head. The ſnout is divided into two broad horns, each terminated with three ſpines or prickles. The ſpines on the back are larger and longer than thoſe in other fiſh of this kind. The noſtrils are very minute;

minute; the eyes large; the lower jaw much ſhorter than the upper; and the teeth very minute in both. This fiſh is found on the Weſtern coaſt, at all ſeaſons of the year, and is eſteemed a great delicacy. It is called the Piper, from the noiſe it makes. They are often ſeen to weigh three or four pounds, and to meaſure from twenty to twenty-four inches.

NATURAL HISTORY of the TUB FISH.

THE form of the Tub Fiſh is more ſlender than that of the piper. The pupil of the eye is green, and on the inner corner of each are two ſmall ſpines. But it is principally diſtinguiſhed from the other ſpecies, by the breadth and colours of the pectoral fins, which are very broad, and of a paliſh green, moſt beautifully edged, and ſpotted with rich deep blue. The back is of a greeniſh caſt: the ſides are tinged with red; and the belly is white. Theſe fiſh are often taken on the coaſt of Cornwall.

NATURAL HISTORY of the LOACH.

THIS is alſo called the Groundling; it is found in ſeveral of our brooks or ſmall rivers, where it uſually keeps at the bottom on the gravel, whence it owes its ſecond name. It is frequent on the ſtream near Ameſbury, in Wiltſhire, where the ſportſmen ſwallow it down alive in a glaſs of white wine, and ſuppoſe it an excellent remedy in conſumptive caſes. In ſhape and colour it reſembles a gudgeon, but is ſmaller and ſhorter. The body is ſoft and ſlippery, and his tail broad, but not forked; and there are few or no ſcales. The colour of the head, back, and ſides is white in ſome, and in others of a dirty yellow, very elegantly marked with large ſpots, conſiſting of numberleſs minute black ſpots. On the upper jaw there are three pair of barbs, one at each corner of the mouth, and two near the end of the ſnout. The eyes are ſmall, and have their iris yellow. The fleſh is extremely tender and delicate.

NATURAL HISTORY of the SALMON.

THIS is a northern fiſh, being unknown in the Mediterranean ſea, and other warm climates; it is found in France, in ſome of the rivers that empty themſelves into the ocean; and North as far as Greenland. In ſeveral countries they are a great article of commerce, being cured different ways, by ſalting, pickling, and drying: there are ſtationary fiſheries for them in Iceland, Norway, and the Baltic; but the greateſt are at Colraine in Ireland; and at Berwick, in Great Britain. The Salmon was known among the Romans; and Pliny ſpeaks of it as a fiſh found in the rivers of Aquitaine.

It has different names, according to its different ages: thoſe which are taken in the river Ribble, in Yorkſhire, are in the firſt year called ſmelts, in the ſecond, ſprods, in the third, morts, in the fourth, forktails, in the fifth, half-fiſh, and in the ſixth, when they are thought to have attained their proper growth, they are deemed worthy of the name of Salmons. In all parts of Europe the ſize of this fiſh is nearly the ſame, and the largeſt weigh from thirty to forty pounds.

The Salmon is a beautiful fiſh; the body is longiſh, covered with ſmall thin ſcales; the head is ſmall in proportion to the body, and has a ſharp ſnout: the tail is forked. The back is of a bluiſh colour; and the other parts are generally white, intermixed with blackiſh or reddiſh ſpots, placed in a very agreeable manner. The female may be diſtinguiſhed from the male, by having a longer and more hooked ſnout, in having ſcales that are not ſo bright, and alſo in having its body ſpeckled all over with dark brown ſpots. The belly is alſo flatter, and not ſo red.

The excreſcence growing from the lower jaw of the male, which is a bony griſtle like the beak of an hawk, is a defence provided by nature, againſt ſuch fiſh as would devour their ſpawn: it grows to the length of about two inches, and falls off when the fiſh returns to the ſea. The Salmon is likewiſe more ſpotted in freſh water than in the ſea: the teeth are ſmall in proportion to its body; and the gills are quadruple, with a broad cover full of red ſpots. The fleſh, when freſh killed, is not ſo red as when it is boiled or ſalted: it is tender, luſcious, and flaky, and ſoon ſatisfies; it is generally preferred to that of other fiſh.

The Salmon is indeed ſo univerſally known, that a minute deſcription is unneceſſary. They are cured in the following manner: they are ſplit, and rubbed with fine ſalt, and after lying in pickle for ſix weeks, they are packed up with layers of coarſe brown Spaniſh ſalt in caſks, ſix of which make a ton. Theſe are exported to Leghorn and Venice, at the price of twelve or thirteen pounds per ton; though they were formerly ſold at a much greater price.

The Salmon lives both in the freſh and ſalt waters; quitting the ſea at certain ſeaſons in order to depoſit its ſpawn in ſecurity, in the gravelly beds of rivers remote from their mouths. Salmons are often taken in the Rhine, as high up as Baſil; they gain the ſources of the Lapland rivers, in ſpite of their rapid courſes, and ſurpaſs the perpendicular falls of Leixſlip, Kennerth, and Point Aberglaſtyn.

This fiſh lives ſeveral years, and may be kept a long time out of the water before it dies. The beſt Salmon is well fed, large, of a middling age, tender, ſhort, reddiſh, and taken in fine clear and running water. It is tender, ſhort and ſavoury, and abounds with volatile ſalt, and oily and balſamic principles, which render it nouriſhing, ſtrengthening and invigorating; it is diuretic, pectoral and reſtorative; but if eat immoderately, being very fat, it cauſes reachings and indigeſtions; and if too old, it is dry, hard, and heavy upon the ſtomach.

The Salmon-fiſhery was an article of ſo much importance, that ſo early as the 13th of Edward the Firſt, an act was paſſed to prohibit the capture of the Salmon, from the nativity of our Lord to St. Martin's day, in the waters of the Humber, Owſe, Trent, Done, Arre, Derwent, Wharfe, Nid, Yore, Swale, and Tees; and ſucceſſive monarchs have provided for the ſecurity of the fiſh in other rivers.

The ſmelts, or fry of Salmon, leave the Merſey about May or June, and then weigh about two ounces a-piece: they return about Auguſt or September, and weigh from one pound and an half to two pounds. Their greateſt magnitude is much the ſame in moſt parts of Europe, and when they are largeſt, they weigh from thirty-ſix to fifty-four pounds; one of this laſt weight being caught at Lachford Cauſey, in the year 1763.

Salmon ought to be kept a few days before it is dreſſed, for which reaſon it is better when it reaches London, than when catched in the Merſey. About the time of ſpawning, it grows more inſipid, and loſes its lively colour. Some begin to be out of ſeaſon preſently after the ſummer ſolſtice, and others ſoon after, which may be known by their falling away, their loſing their beautiful ſpots, and by their colour;

colour; insomuch, that when they are quite out of season, they look like a fish of a different species, and are then called knippers.

The Salmon chuses the river for his abode about six months in the year; they enter the fresh water about December or January, and are sometimes caught in the Mersey, in November, February, or March, where they continue till the autumnal season, at which time they cast their spawn, and soon after return to the sea. But directly the contrary of this is reported of those in the river Ex in Devonshire, and the river Wye and Usk in Monmouthshire, where the Salmon are said to be in season during the other six months.

When spawning time arrives, the female seeks a proper place, in a gravelly bottom, where she has been observed to work with her head, tail, belly, and sides, till she has formed a kind of *nidus*, of the same dimensions with herself; which done, she discharges her spawn, and retires; then the male or milter, advances: this is no sooner over, but the female returns to the male, when they use their joint endeavours to cover their brood with the gravel, in which they work with their noses like hogs: after this they return to the deeps to recover their strength, which they do in about twenty days. About this time this fish is of very little value; but to prevent their destruction, the laws of the land inflict a penalty on those who shall destroy Salmon between the 11th of August and 22d of November; but it would be better for the community, if it was the 11th of September and the 22d of December.

There is nothing relative to this fish, which has been more talked of, than its agility in leaping over the obstacles which oppose its passage either to or from the sea; for they are frequently seen to throw themselves up cataracts and precipices many yards high. They sometimes make several essays before they can gain their point, and when they have done it, it has been often to their own destruction, for they have leapt into baskets placed on purpose to catch them. There is a remarkable cataract on the river Tivy in Pembrokeshire, where people often stand wondering at the strength and agility which they exercise to get out of the sea into the river; on which account it is known in those parts by the name of the Salmon-leap. On the river Wear, near the city of Durham, there is another of this kind, which is supposed to be the best in England: there is another at old Aberdeen in Scotland, where such great plenty of Salmon has been caught, that they have been deemed the principal trade of the place. Whenever their passage to the sea is intercepted by weirs, or any other contrivance, they soon grow sickly, lean, and languid; and if they are caught in that condition, when they come to the table, they prove tasteless and insipid: in the second year they pine away and die. It is worth observation, that the Salmon is not only desirous of returning back to the rivers, but to that very river where it was spawned, as evidently appears by an experiment made by fishermen and others, who have caught them when very small, and have run a small ribband, tape, or thread, through the tail fin: by this mark they have been certain that they have retaken the same fish, at the same place, as they returned from the sea: by this means they have likewise discovered, that the Salmon is of very quick growth, and considerably more so than any other fish.

The chief rivers in England that yield this excellent fish are the Thames, Severn, Mersey, Trent, Medway, Dee, Ex, Usk, Wye, Lon, Tyne, Werkington, Weaver, &c. However, our London markets are supplied soonest from the north, where they are not only more plentiful, but are in season before those of the southern rivers. The Mersey greatly abounds with Salmon, which in the spring strive to get up that arm of the sea, and with difficulty evade the nets, which the fishermen spread to catch them before they get to Warrington-bridge, at which the place the river becoming narrower, and the land-owners having an exclusive right, each proprietor, by his agents, catches Salmon, which, in the whole, amounts to above one thousand pounds a year; by which means the towns of Warrington, Manchester, and Stockport, are well supplied, and the overplus sent to London, by the stage-coaches; or carried on horseback to Birmingham, and other inland towns. Thus having given a general account of the nature of the Salmon, we shall now proceed to the method of taking him with the angle.

It is necessary to premise, that the Salmon does not remain long in a place, but seems desirous of getting still nearer to the head of the spring. He does not lie near the bank-side, nor under the roots of trees, but swims in the deep and broad parts of the water, generally in the middle and near the ground. But the Salmon-smelts generally lie in the rough and the upper part of a gentle stream, and usually pretty near the middle in the months of April and May, and nearer the side earlier in the spring.

The most alluring bait for the Salmon, in the western islands of Scotland, is a raw cockle taken out of the shell; with this they fish at the bottom, using a running bullet. This method is practised in the river Medway, in Kent, with success: let the cockle fall into a shallow, from which there is a gradual descent, into a deep hole. In most of the Salmon rivers of France, they use prawns or muscles taken out of the shell. In the month of October, they go up the smaller rivers as far as they can to spawn. At that season of the year many Salmon get high up the river Mersey, where some few are caught by angling: but the far greatest part of them are destroyed by poachers with spears, though the first are at that time of little or no value. Thus considerable damage is done to the breed of Salmon, and it were to be wished, that the justices of the peace would a little more exert themselves, and enforce the laws to punish these offenders.

The most usual baits are lob-worms, small dace, gudgeons, bleaks, minnows, or two well-scoured dew-worms, which should be often varied, in order to suit the humour of this fickle fish; as what he likes one day he will despise the next. Though it must be owned it is a very disagreeable circumstance to an angler, and which he often meets with to exercise his patience, to see the fish sporting on the surface of the water, and not be able to tempt him with any of his baits. However he generally bites best about three in the afternoon, in May, June, and July, especially if the water happens to be clear, and there is a litttle breeze of wind stirring; but there will be still a greater probability of success if the wind and stream set contrary ways. There is a fly called the horse-leech-fly, which he is very fond of; they are of various colours, have great heads, large bodies, very long tails; and two, some have three pair of wings; behind each pair of wings, whip the body about with gold or silver twist, or both, and do the same by the head; with this fly, fish at length, as for trout, and grayling; but if you dip, do it with two or three butterflies, of different colours, or with some of the most glaring small flies you can find. When you make use of the fly, let your hook be strong and large; but it would be better to have two well scoured lob-worms, as they have been found most successful in fishing at the bottom. In this case, let your hook be large, and armed with gimp; for though a salmon, when struck, seldom attempts to bite the line, yet, as you will be obliged to play the fish for some time, the line must rake

againſt his teeth, and you will be in great danger of loſing your prize without this precaution. Next to gimp are recommended the briſtles of a Weſtphalia hog doubled; which yet are only preferable to ours on account of the length. If, therefore, you cannot eaſily procure the former, you may make uſe of our own, which being often lapped into the length of half a yard, have been found proof againſt the teeth of a jack, when trowling for that fiſh. Whenever you obſerve a Salmon leap out of the water, you may ſafely conclude there is a deep hole not far off; and if the river is too broad for you to throw a fly, or if a contrary wind hinders you, then lay your ledger-bait as near the hole as you can, and you may probably meet with ſucceſs, for he always chuſes ſuch places for retirement. If you bait with a dace, gudgeon, &c. then put on your ſwivel and real, and make uſe of a large cork-float, with your live bait about mid-water.

For the Salmon-fry, or ſcegger, called alſo a Salmon-ſmelt, the propereſt baits are ant-flies, brandlings, earth-bobs, gentles, black and dun gnats, all coloured ſmall hackles, and dub'd flies according to the ſeaſon; when they riſe at fly, and a little before they leave the river, they uſually get together in large ſhoals, where you will ſee ten or a dozen riſe at a time; if you light of a ſhoal, you will never fail to have ſport, as they riſe very freely. You may uſe three or four hooks to one line, tied to ſingle hairs. They are alſo frequently caught with the red worm in fiſhing for gudgeons. The places where they are generally found are the ſcours near the deeps, or amongſt wood or weeds. They always leave the Merſey in May or June. Two of them were, whilſt ſmall, put into a fiſh-pond, at Stockport, and took out again in three years, when they weighed five pounds.

The chief Salmon fiſheries in Europe, are along the coaſts of England, Scotland and Ireland; the fiſhing uſually begins about the firſt of January, and ends the eleventh of Auguſt. It is performed with nets in the places where the rivers empty themſelves into the ſea, and along the ſea-coaſt thereabout; becauſe theſe fiſh are ſeen to crowd thither from all parts in ſearch of freſh water. They alſo fiſh for them higher up in the rivers, ſometimes with nets, and ſometimes with locks or weirs made for that purpoſe with iron gates: theſe gates are ſo contrived, that the fiſh in paſſing up the river can open them with their heads, but they are no ſooner entered than the gates clap to, and prevent their return. Thus the Salmon are incloſed as in a reſervoir, where it is eaſy to take them.

Near Flixon in Lancaſhire, they fiſh for Salmon in the night-time, by the light of torches, or kindled ſtraw, which the fiſh miſtaking for the day-light, make towards, and are ſtruck with the ſpear, or taken with the net, which they lift up with a ſudden jerk from the bottom, having laid it in the evening before oppoſite the place where the fire is kindled. In ſome parts of Scotland, it is ſaid, they ride a fiſhing up the rivers, and when they eſpy them in the ſhallows, they ſhoot them with firearms. It is very common to dart Salmon as they are endeavouring to get over the weirs.

When the fiſh are caught, they open them, take out the guts and gills, and ſalt them in large tubs made for that purpoſe, out of which they are taken before October; and are packed up in caſks, from 300 to 450 pounds weight.

The ſeaſon for fiſhing in the Tweed, begins November the 30th, but the fiſhermen work very little till after Chriſtmas; it ends on Michaelmas day: but the corporation of Berwick, who are conſervators of the river, indulge the fiſhermen with a fortnight after that time, on account of the alteration of the ſtyle.

There are forty-one conſiderable fiſheries on the Tweed, extending upwards of about fourteen miles from the mouth, which are rented for near five thouſand four hundred pounds per annum. A misfortune attends this river, which requires a parliamentary remedy: there is no act of parliament for preſerving the fiſh in it during the ſence months, as there is in the caſe of many other Britiſh rivers. The Tweed being the boundary between England and Scotland, part of it belongs to the city of Berwick, and the whole north ſide (beginning about two miles from the town) is entirely Scotch property. From ſome diſagreement between the parties, they refuſe to unite for the preſervation of the fiſh; and in ſome fiſheries on the north ſide they continue killing Salmon the whole winter, when the death of one fiſh is the deſtruction of thouſands.

About the month of July, the capture in the Tweed is prodigious: in a good fiſhery a boat load of them are often taken at a time: upwards of ſeven hundred fiſh have been known to have been taken at one hawl: but from fifty to one hundred is no uncommon occurrence.

NATURAL HISTORY of the SALMON TROUT.

THIS fiſh is alſo called the Bull Trout, from the thickneſs and ſhortneſs of its head. It differs from the ſalmon in having the tail leſs forked; from the grey, in having a ſhorter and thicker head; and from both in being ſmaller, ſeldom exceeding twenty inches in length. Its fleſh is white, and leſs delicate than that of the ſalmon and grey.

They delight to lie in deep holes, and uſually ſhelter themſelves under the root of a tree. When they watch for their prey, they generally chuſe that ſide of the hole which is towards the ſtream, that they may the more readily catch whatever food the ſtream brings down. They will riſe at an artificial fly like a ſalmon: but the beſt bait for them is a well ſcoured brandling, eſpecially thoſe that breed in a tanner's yard.

You may angle for them any time in a morning, and in the afternoon from five till night. They are in ſeaſon all the ſummer. When you try to catch them, remember to keep out of ſight, and let your line fall into the ſtream, without any lead, except one ſingle ſhot, and then it will be carried gradually into the hole. When you have a bite you ought not to ſtrike too eagerly; they bite freely enough, and ſtruggle hard for their lives. It is neceſſary to obſerve, that ſome give the name of Salmon Trout to a young ſalmon, which has occaſioned ſeveral to run into errors in treating of this fiſh. They have likewiſe in France a kind of Pond Trout, which they call a Salmon Trout, that grows to ſuch a magnitude as to weigh above thirty pounds; and in the Leman Lake near Geneva, there are ſome of this kind, that weigh fifty pounds.

NATURAL HISTORY of the GREY:

IT differs but little from the Salmon in ſize, though it is very different in ſhape; being broader and thicker; and the tail not being forked. The body is all over ſpeckled with aſh-coloured or grey ſpots; from whence it derives its name. The fleſh is preferable to that of ſalmon, and bears a much higher price. This fiſh has great ſtrength and agility, making its way from the ſea into the rivers with extreme ſwiftneſs; ſurmounting almoſt every obſtacle with the greateſt eaſe. This fiſh is therefore ſeldom taken, and conſequently but little known. It does not aſcend the freſh waters till Auguſt, which is the time of ſpawning.

NATURAL

Natural History of the TROUT.

THE Trout is a fiſh of excellent taſte, and is covered with ſmall ſcales, uſually ſtreaked with red. There are ſeveral ſpecies of this fiſh, which live in various places, and differ in colour and ſize. Some are found in deep and rapid rivers, others in lakes; ſome are of a blackiſh colour, others reddiſh, and rather of a gold colour, and variouſly marked with ſpots of a purple or vermillion die; but on the belly they have a yellowiſh caſt.

This fiſh ſwims with much agility and ſwiftneſs, and is ſaid on hearing thunder to be ſo aſtoniſhed, as to become immoveable. It feeds upon worms, ſlime, mud, inſects, and ſmall fiſhes, which it purſues with ſo much eagerneſs, from the bottom to the ſurface of the water, that it ſometimes throws itſelf into the boats paſſing near it.

Trouts, beſides being well taſted, produce good juice, becauſe they are always in motion, feed upon good food, and uſually ſwim in clear and running ſtreams: thus they acquire leſs groſs and viſcous humours, eat ſhort, and are eaſily digeſted; but they ſoon putrefy and corrupt, and therefore ſhould be eaten ſoon after they are brought out of the water.

The Trout contains much oil, volatile ſalt, and phlegm; and agrees with any age and conſtitution. In ſummer it is moſt delicious, but in winter it is deprived of almoſt all the excellency of its taſte. It may be boiled, fried, roaſted, or baked; and ſome ſalt it for exportation.

There is a variety which is called in Latin Thymallus, a Thymi Odore, becauſe it ſmells like thyme. It is delicious food, eaſy of digeſtion, has good juice, and ſo wholeſome, that in ſome places they allow ſick perſons to eat it. Its ſhape reſembles that of the common Trout, and it alſo lives in clear and running waters: it feeds upon the ſame food, and in ſome countries is more valued for the goodneſs of its taſte than the other ſorts. Its fat is good to remove prints of the ſmall-pox, deafneſs, noiſes of the ears, ſpecks, and catarrhs of the eyes.

The Trout is of a longiſh form, and reſembles the ſalmon more than any other fiſh. The head is ſhort and roundiſh, the noſe blunt, the body thick, and the tail broad. The mouth is wide, and it has teeth, not only in the jaws, but on the palate and tongue. The eyes are large, with a reddiſh circle round the pupil; the reſt of the iris being of a ſilver colour. The ſkin readily falls into wrinkles, and ſeparates from the fleſh. In the larger trouts, the back is of a duſky hue, and full of black ſpots, which in ſome are mixed with red. This fiſh has two fins on the back; that next the head is full of black ſpots, and the edge of that near the tail is of a vermillion colour. On the belly there are two pair, which are always either red or yellow.

It is ſurprizing that this common fiſh has eſcaped the notice of all the ancients, except Auſonius, who only celebrates it for its beauty; and that ſo delicate a ſpecies ſhould be neglected at a time when the folly of the table was at its height; and that the epicures ſhould overlook a fiſh that is found in great quantities in the lakes of their own neighbourhood, when they ranſacked the univerſe for dainties. The milts of *Muræna* were brought from one place; the livers of *Scari* from another, and oyſters even from ſo remote a ſpot as our *Sandwich*; but there was, and is now, a faſhion in the article of good living.

The Trout is a voracious fiſh, and affords excellent diverſion to the angler. Theſe fiſh ſhift their quarters to ſpawn, and, like the ſalmon, make up towards the heads of rivers to depoſit their ſpawn. They delight in cool and ſmall ſtreams, which deſcend from rocky hills, and ſeem particularly fond of ſwimming againſt the courſe of the water. They are found in ſmall rivers among the Alps, the waters of which are ſo cold, that no other fiſh can accompany them.

Trouts are not in the higheſt ſeaſon when they are fulleſt of ſpawn, for they are fatteſt, and have the moſt delicious taſte in July and Auguſt. They begin, however, to be in ſeaſon in March, and become ſo in ſome rivers much ſooner than in others. In winter they are lean, ſick, and unwholſome, breeding a kind of worm with a large head, which in ſome degree reſembles a clove. At that time the beautiful ſpots diſappear, and the lively colour of the belly becomes duſky and diſagreeable. But, towards the latter end of March, he rouzes from his lethargy, rubs off his ill-bred foes againſt the gravelly bottoms, and ſoon after recovers his former ſtrength and vigour. The fleſh is drier and leſs tender than that of the ſalmon; it is, however, eſteemed the moſt agreeable of all thoſe fiſh that reſide continually in freſh water.

The Fordich Trout ſeems to be of a different ſort from the reſt, becauſe it is almoſt as large as a ſalmon, and lives nine months in the ſea; beſides it is ſeldom caught with the angle, being ſuppoſed not to feed at all in freſh water; and there ſeems to be a probable ground for this opinion, for when they are opened there is nothing found in their maw. Yet their return to the river is ſo very conſtant and punctual, that the fiſhermen know almoſt to a day when to expect them. When this fiſh is in full ſeaſon, the fleſh of it cuts white.

The uſual baits for a Trout are a worm, minnow, and fly, either natural or artificial. The proper worms are the brandling, two upon a hook, lob-worm, earth-worm, dung-worm, and muggot, but eſpecially the two firſt, and indeed, in fiſhing at the bottom, the lob-worm is preferable, and is moſt generally uſed.

This fiſh, as already obſerved, delights in the ſwifteſt ſtreams, at a ſtream-tail in ſpring and latter end of ſummer: in May he keeps the upper end, and on the ſhallows in ſummer, or at the tails of mills: he is particularly fond of a hole covered with boughs, and where the roots ſhoot down to the water's edge, where he can find a good hold: in ſuch a place you may find the largeſt, and conſequently you muſt angle for them near ſuch places. When they watch for their prey, they generally ſhelter themſelves under a bank, a large ſtone, or in the weeds, where they are often ſeen lurking entirely covered over except their heads. When they are diſcovered in this ſituation, go a little up the ſtream, and with great care and caution muddy the water, putting in your bait immediately in the muddy part; then keeping yourſelf as far from the bank as you can, in order to be out of ſight, follow your float, and expect ſucceſs.

Trout may be taken in this manner, either with a minnow, or two well ſcoured lob-worms. When you uſe two worms, put the firſt on the hook with the head foremoſt, and then ſlipping it a little up the line to make room, put on the other with the tail foremoſt, after which draw the firſt down to it quite cloſe. This is likewiſe a good bait when you angle in the dawn of day, or in the duſk of the evening, or even in the night when it is dark. In this caſe you muſt put no lead on your line, but throw your bait as gently as you can acroſs the ſtream, and draw it ſoftly to you on the top of the water. This is the beſt method of catching the oldeſt and largeſt Trout, for they are very fearful and ſhy in the daytime, but in the night they are bold and undaunted, and generally lying near the top of the water in expectation of meeting with food; for if they ſee any thing in motion, let it be what it will, they will certainly

tainly follow it, if it glides gently along. If you put the point of your hook in at the head of your firſt worm, and out at the knot, and ſlip it a little way up the line, that you may bait the other the ſame, ſo that both tails may play, you will find it anſwer very well.

In angling for a large Trout in muddy water, it requires ſome art in baiting your hook; ſuppoſe, for inſtance, the bait is a dew-worm, you muſt then thruſt the hook in towards the tail, a little above the middle, and out again below the head, then draw him above the arming of the hook, or whipping, and put the point into the head of the worm, till it is very near the place where the point of the hook firſt came out, and ſo draw back the worm, or that part that was above the ſhank. This hook ſhould be pretty large. A water clearing, after a flood, or dark, cloudy, and gloomy weather, when it is windy, is moſt favourable for worm fiſhing. In March, April, September, and part of October, the warmeſt ſun-ſhiny weather, and the middle of the day, is beſt.

Some make a practice of fiſhing at the bottom in the dark, with a little bell fixed to the top of the rod, in ſuch a manner, that when the Trout takes the bait, the ſound of the bell may give notice of the bite; but others think this method is very precarious, becauſe the leaſt weed that touches your line as it comes down the ſtream will deceive you. The ſureſt way is to hold your rod in your hand, for as the Trout is a bold biter, you will eaſily perceive when he takes the bait: as ſoon as you have ſtruck it, give it the but of your rod, for if you hold it the leaſt upon a level, you are in danger of loſing your line. There is a very excellent method: make a pair of wings of the feather of a land-rail, and point your rod with one or more cadis; your hook ſhould be briſled, and the head of your cadis kept cloſe to your wings, and angle with a rod about five yards, and a line about three; caſt your wings and cadis up the ſtream, which will drive it down under the water towards the lower part of the hole; then draw it gently up the ſtream, a little irregular, ſhaking your rod, and in a few caſts you will be ſure to hook him, if there is one in the hole. You may angle the ſame way with two brandlings. If you uſe two cadis with your wings, run your hook in at the head, and out at the neck of the firſt, and quite through the other from the head to the tail: this is a much approved method for catching large Trout.

In angling with a fly, let your rod be ruſh-tapered, with a very ſlender top, that you may throw your fly with greater certainty and eaſe; for if the top is too ſtiff, the fly will be ſoon whipped off. Your line ſhould be three times the length of your rod. In this kind of angling, you ſhould place yourſelf ſo that the wind may be upon your back, or at leaſt you muſt chuſe ſuch a time and place, that the wind may blow down the ſtream, and then it will aſſiſt you in laying your fly upon the water, before your line touches it; for if your line touch the water firſt, it will cauſe a rippling that will fright the fiſh away.

The cad-bait upon the point of the hook with the artificial fly is recommended. Or another way to angle with the cad-bait, is on the water, as with a fly. It muſt ſtand on the ſhank of the hook, as the artificial fly, (not come into the bend, or the fiſh will not value it, nor if you pull the blue gut out) and thus it is a moſt excellent bait for the Trout. Where the river is not violently ſwift, you may place a very ſlender lead on the ſhank, and draw the cad-bait over it: raiſe it often from the bottom, and ſo let it ſink again; by which means you will find good ſport, either in muddy or clear water. You may imitate the cad-bait, making the head of black ſilk, and the body of yellow wax, or of ſhamoy. When the fiſh appear at the top, they will take the oak-worm upon the water, rather than under it, or than the fly itſelf; and it is more deſired by them. After you have dibbed with theſe flies on the ſurface till they are dead, cut off their wings, and fiſh with them at mid-water, or a little lower. You may dib for a Trout alſo with a fly or graſshopper, as you do for a chub, under a buſh, by the bank ſide, with a ſtrong rod, and a ſhort ſtrong line. If they do not riſe after half a dozen trials, there are none in the ſtream, or they diſlike your bait.

You need not be very particular in the choice of your flies, for a Trout is not difficult, nor yet very curious about the ſeaſon, for ſome have angled ſucceſsfully with an artificial May-fly in Auguſt. The time of the Trout's biting is from ſun-riſing till near eleven in the morning, and from two in the afternoon till ſun-ſet; and yet the moſt certain times, are nine in the morning, and three in the afternoon, eſpecially if the wind be at ſouth, for when it blows from that point it is moſt favourable to the angler. At this time, if you angle with a loach about a quarter of a yard deep in the ſtream, you are ſure of catching fiſh. If you have not this bait, a bull-head, with the gill fins cut off, may prove a good bait, or a minnow, for want of the others. And as the Trout may be deceived by almoſt any fly at the top, ſo he ſeldom refuſes any worm at the bottom, or ſmall fiſh in the middle; for which reaſon he is ſometimes caught when trolling for jack.

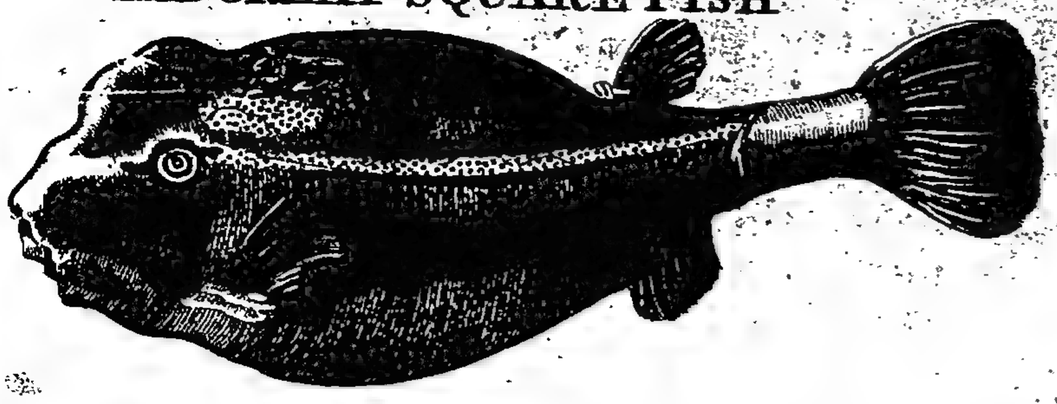
You may likewiſe dib for Trout in the ſame manner as you do for chub, only let your fly drop as gently into the water as poſſible, and keep it eaſily gliding along the ſurface; let it ſink a little, and ſuddenly raiſe it again, with a ſtrong rod, and a ſhort ſtrong line; but be careful to keep out of ſight, for the ſhadow of your rod, or the flight of a bird over the river, will make them fly almoſt as ſwift as the bird, and it will be ſome minutes before they will ſhew themſelves again. You will find good ſport if you dib with the green ſnake-fly whilſt alive, which is thus practicable: collect a quantity of them into a long draw-box, with holes in the cover to give them air, where alſo they will continue freſh and vigorous a night or more; take them out from thence by the wings, and bait them thus upon the hook: firſt take one, for it is common to fiſh with two of them at a time; and putting the point of the hook into the thickeſt part of the body under one of the wings, run it directly through, and out at the other ſide, leaving him ſpitted acroſs upon the hook, and then taking the other, put it on after the ſame manner, but with its head the contrary way; in which poſture they will live upon the hook, and play with their wings for a quarter of an hour, or more: but you muſt be careful to keep their wings dry; and alſo that your fingers be not wet when you take them out to bait them; for then your bait will be ſpoiled.

With the ſtone-fly you may likewiſe dib, but with this variation: the green drake is common both to ſtream and ſtill, and to all hours of the day; this is ſeldom dibbed with but in the ſtreams, (for in a whiſtling wind a made fly in the deep is better,) but obſerve, that morning is the time: but much better towards eight, nine, ten, or eleven o'clock at night, at which time alſo the beſt fiſh riſe, and the later the better, provided you can ſee your fly, and when you cannot, a made fly will anſwer the purpoſe.

Trouts are taken in ſome parts of England by tickling them; there was a perſon who was very expert in that art; he would grope for them in their lurking places, and gently tickle their ſides, which they ſeemed to be delighted with, till, at length, approaching their gills, he held them faſt, and made

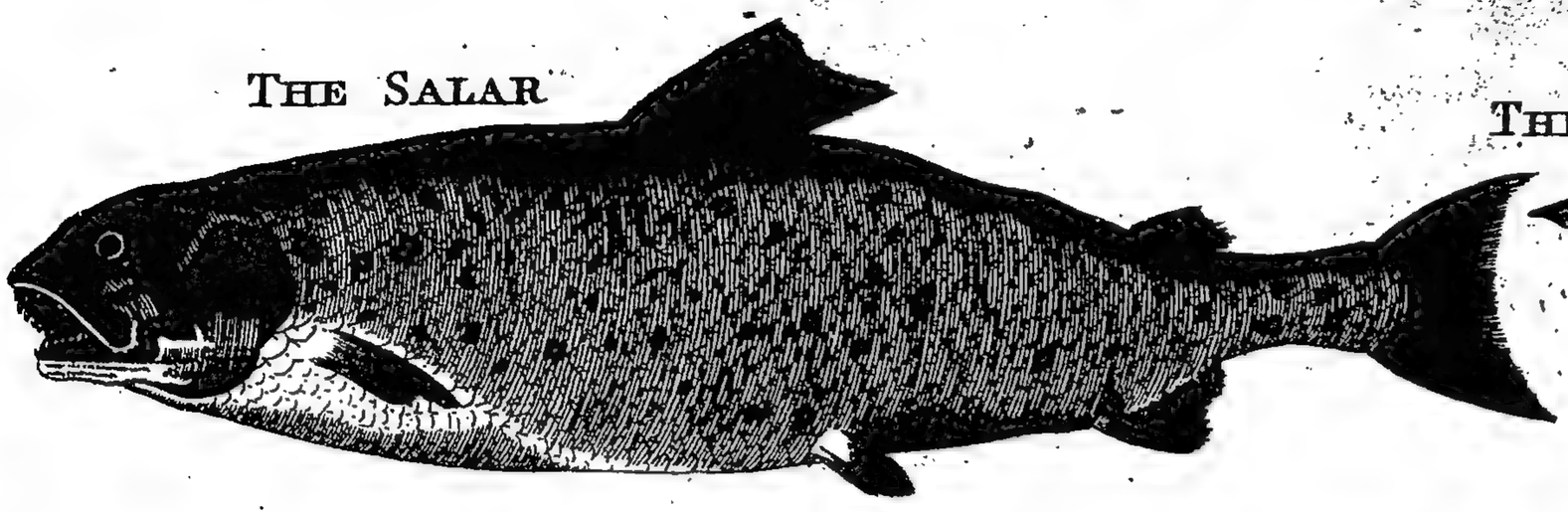
FISHES.

THE GREAT SQUARE FISH



THE BROAD GUAPERVA

THE SALAR

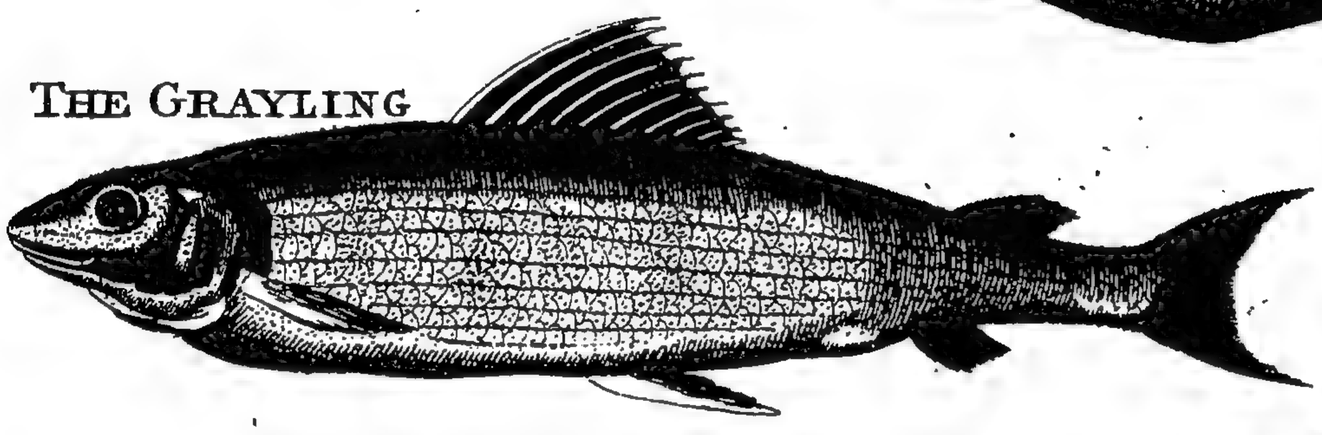


THE OXYRINCHUS

THE GILT CHARRE

THE RIVER TROUT

THE GRAYLING



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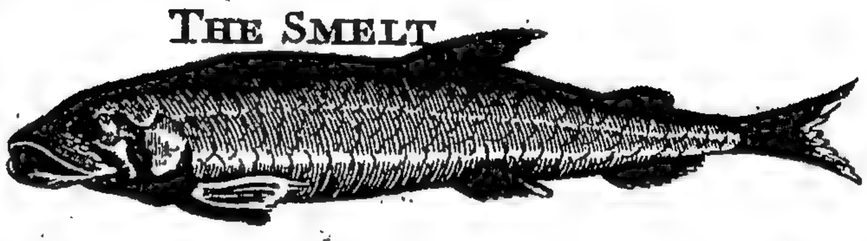
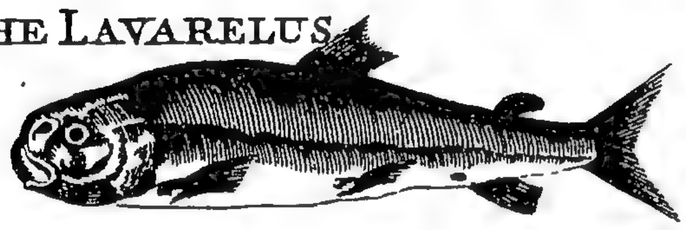
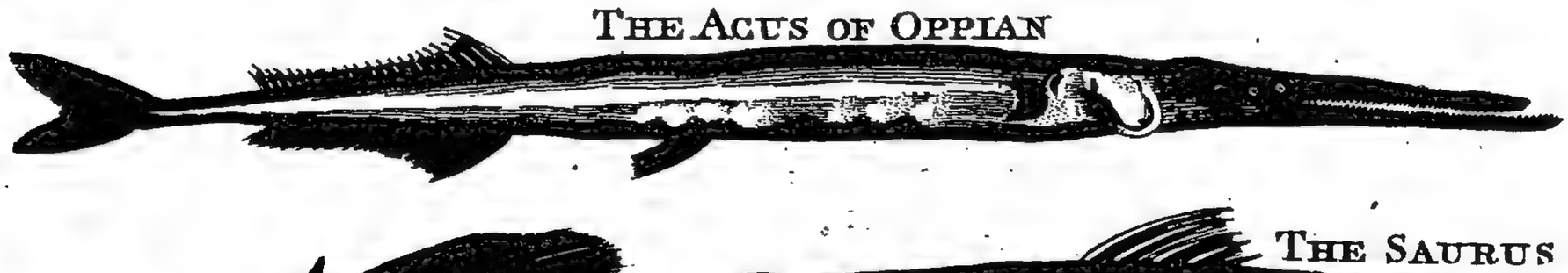


THE LAVARELUS

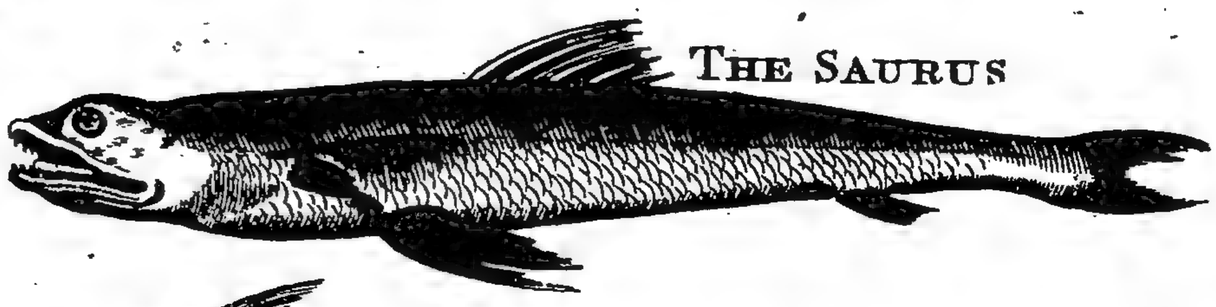


THE SALMARINUS

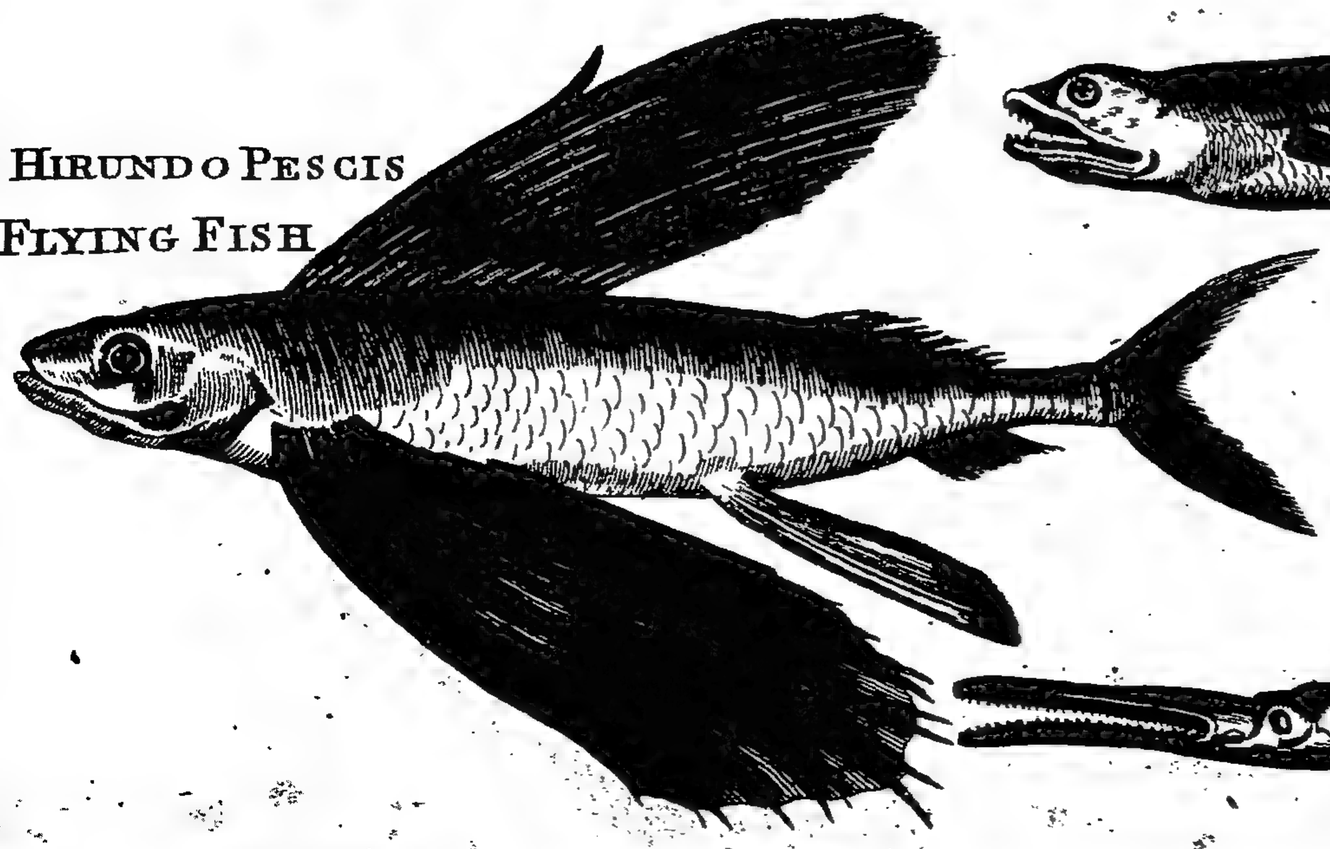
THE ACUS OF OPPIAN



THE SAURUS

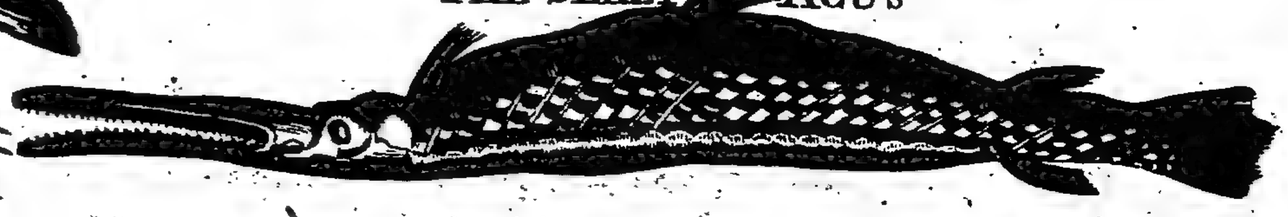


THE HIRUNDO PESCIS
or FLYING FISH



THE LITTLE IPHYRŒNA

THE SEALY ACUS



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Eastgate sculp.

made them priſoners; and it is obſerved in the Philoſophical Tranſactions, that carp are ſometimes taken by the ſame way. Great quantities are alſo taken with the ſpear and lamp.

Natural History of the SAMLET.

THIS is the leaſt of the trout kind, and is frequently found in the Wye, in the upper part of the Severn, and the rivers that run into it, in the north of England, and in Wales. It has a great reſemblance to the trout, but is much ſmaller, ſeldom exceeding ſix or ſeven inches in length, and an inch and an half in breadth. It has fewer ſpots than the trout, and thoſe which it has are not ſo bright. The Samlet is whiter, and has a more forked tail; the ſides are not ſo yellow under the ſpots; and the lateral lines in a trout are larger and more red than in the Samlet. The Samlet has tranſverſe ſpaces near the lines of a bluiſh colour, which the trout has not. Some imagine the Samlet to be the fry of the ſalmon, but they are certainly miſtaken.

Natural History of the CHARR, or RED CHARR.

THE Charr is an inhabitant of the lakes of the north, and of thoſe of the mountainous parts of Europe. It is found in great abundance in the cold lakes on the ſummits of the Lapland Alps, and is almoſt the only fiſh that is met with in any plenty in thoſe regions. Very few lakes in our iſland produce this fiſh, and even thoſe in no great plenty. It is found in Winander-mere, in Weſtmorcland; and in Llyn Quellyn, near the foot of Snowdon, and in certain lakes in Merionethſhire. It is alſo found in Scotland, in Loch Inah, and other neighbouring lakes.

The body of the Charr is longer and more ſlender than that of the trout, and the back is of an olive colour, ſpeckled with whitiſh ſpots. In general the belly is red, though it is ſometimes white, eſpecially in the ſpawners: the ſcales are very ſmall, and the lateral lines ſtraight: the mouth is wide, and the jaws are nearly equal: the lower part of the fins are of a vermillion die, and the gills are quadruple. The Charr has teeth both in the jaws and on the tongue; and in the upper jaw it has a double row. The fleſh is ſofter and more tender than that of a trout. The Charr is in very high eſteem, and exceeding ſcarce. The inhabitants in the neighbourhood of Winander-mere make a practice of potting Charrs, which are uſually ſent as preſents to remote friends; but they cannot be taken in ſufficient quantities for ſale even at an unreaſonable price.

The GELT-CHARR.

The Gelt or Barren Charr, is one that has not ſpawned the preceding ſeaſon, and on that account is reckoned to be in the greateſt perfection. It is more ſlender than the red charr, as being without ſpawn. The back is of a gloſſy hue; the ſides ſilvery, mixed with blue, and ſpotted with pale red: the ſides of the belly are of a pale red, and the bottom white. This is found only in thoſe lakes, which are alſo inhabited by the red charr.

Natural History of the GRAYLING, or UMBRÆ.

THIS is a voracious fiſh, and takes a bait very eagerly. It ſwims rapidly, and diſappears like the tranſient paſſage of a ſhadow, from whence it probably derived the name of umbra.

"The *umbra* ſwift eſcapes the quickeſt eye."

It is a fiſh of an elegant form: the body is longer and flatter than that of a trout, and ſeldom exceeds eighteen inches in length. The head is duſky: the covers of the gills of a gloſſy green: the back and ſides are of a fine ſilvery grey, from whence it has its name of Grayling; though they ſeem to glitter with ſpangles of gold, and are marked with black ſpots irregularly placed. The top of the back fin is red, and the lower part of a bluiſh purple: the fins of the belly are bluiſh, ſpotted with black. The lips are rough like a file, the tongue ſmooth, and the gills quadruple.

The Grayling haunts clear and rapid ſtreams; particularly thoſe that flow through mountainous countries. It is found in the Hodder, the Dove, the Trent, the Derwent, the Wye, and the Lug. It is alſo very common in Lapland. It is a firm, good, and wholeſome fiſh. It may be eaten all the year, but in December it is in the higheſt ſeaſon.

Natural History of the SMELT.

SMELTS are uſually about ſix inches long, and near an inch in breadth, but they are ſometimes found of the length of twelve inches; they have a very peculiar ſcent, from whence their Engliſh name is derived—*ſmelt*, that is, *ſmell it*. People greatly diſagree reſpecting the ſcent of this fiſh; ſome aſſert it flavours of the violet, others of the cucumber: we acknowledge that we are of the latter opinion. The Germans however diſtinguiſh it by the delicate title of *ſtinck-fiſch*. The Smelt is the leaſt of theſe kind of fiſh, and is of a very beautiful form and colour: the head is ſo tranſparent, that all the lobes of the brain may be plainly and diſtinctly ſeen; and the ſkin in general is ſo thin, that, with a good microſcope, the blood may be obſerved to circulate. The ſcales are ſmall, and fall off with the ſlighteſt touch. The back is of a duſky colour, but the belly and ſides ſhine like ſilver: the tail conſiſts of nineteen rays, and is forked. The iris of the eye is ſilvery; the pupil of a full black; and the under jaw is the longeſt. It has four large teeth in the front of the upper jaw, and ſeveral ſmall ones in the ſides of both. It has two rows of teeth in the roof of the mouth; and two others of large teeth on the tongue.

Smelts inhabit the ſeas that waſh the iſlands of Great Britain and Ireland the whole year, and never go very remote from ſhore, except when they aſcend the rivers. It has been obſerved, that they are ſeen in rivers ſome months before they ſpawn, but immediately afterwards they all return to the ſalt water, and never appear again in the freſh ſtreams till the next ſeaſon. The fleſh of the Smelt is ſoft and tender, and of a delicate taſte; and is therefore in very high eſteem. They are frequently ſerved up to table as a kind of garniſh to large fiſh; and they ought, in that caſe, to be conſidered only as garniſh, for they are ſeldom fit to be eaten; the cook generally keeping them ſo long before the fire that they become dry, inſipid, and taſteleſs.

Leſs than twenty years ago, Smelts were ſo ſcarce and valuable as ſometimes to ſell for four or five pounds the hundred; but they are now to be purchaſed, in general, for eight, ten, or twelve ſhillings per hundred.

In March, if the ſpring be mild, prodigious quantities of this delicate fiſh make their appearance in the river Merſey, which often ſeems of a greeniſh colour, from the vaſt bodies of Smelts which then ſwim about. At this time, every boat, every fiſherman, and every net, is employed, and even the boys with cabbage-nets, catch theſe fiſh, which are double the ſize of thoſe uſually caught in the Thames; ſometimes

ſometimes the baſkets, pails, boats, and the very banks, are filled with ſparlings, as they are called in Cheſhire, where, from the great plenty, they are frequently ſold at four-pence *per* ſcore. Some of theſe fiſh have been caught in Roſtern Mere, and other ſtill waters, where the fiſhermen have waſhed the ſpawn from their nets; but theſe fiſh appear lean; neither do they breed in ponds.

The beſt way of angling for them is with a paternoſter line, with a ſmall ſhot to ſink it under water: your baits ſhould be earth-bobs, gentles well ſcoured, paſte, or the fiſh itſelf, cut into ſmall bits ſufficient to cover your hook; they are ſeldom caught with angling, as they ſtay about Warrington but a little time after they have ſpawned, but they are caught in the ſalt part of the river all the year round with nets.

The SOUTHAMPTON SMELT.

This agrees with the common kind, in having two back fins, in colour, in the tranſparency of the back and head, &c. but has nothing of the violet or cucumber ſmell. It ſwarms in the ſea about Southampton, and is the common bait for whiting, mackrel, flat-fiſh, &c.

NATURAL HISTORY of the GUINIAD.

THE Guiniad is an inhabitant of ſeveral of the lakes of the Alpine parts of Europe. It is alſo found in Scotland, Ireland, and Wales, particularly in Pemble-meer, a lake in Merionethſhire. The ſhape of this fiſh is not much unlike that of the ſalmon, the uſual length is about twelve or thirteen inches, and its greateſt depth about three inches. The back is duſky, and the belly white. The head is ſmall, ſmooth, and of a light blue on the top, ſpeckled with darker ſpots, and the ends of all the fins are of a dark blue: the eyes are very large, and the pupil of a deep blue: the mouth is ſmall and toothleſs; and the covers of the gills are ſilvery, powdered with black. The Britiſh word guiniad, which ſignifies whiting, was given it on account of the whiteneſs of its body. They are in ſeaſon in the ſummer, and, though the fiſh is white, it has the flavour of that of the trout: it is however much higher in eſteem, becauſe it is a greater rarity. The Scotch have a tradition, that it was firſt introduced there by the beauteous queen, their unhappy Mary Stuart. Theſe fiſh approach the ſhores in immenſe quantities in ſpring and in ſummer, and, in many places, prove a great relief to the poor.

NATURAL HISTORY of the PIKE.

THE Pike has a roundiſh oblong body, with a flat head, and ſquare back: the ſnout is very prominent, and the lower jaw is ſomewhat longer than the upper. The mouth is very wide, and the teeth are very ſharp, diſpoſed only in the front of the upper jaw; but in both ſides of the lower jaw, in the roof of the mouth, and ſometimes on the tongue: the eyes are ſmall, and the tail is forked. The body is covered with ſmall thick ſcales, which are moiſtened on the edges with a kind of ſlime that has a greeniſh caſt; and the younger the fiſh is, the greener he appears. The back and ſides when turned towards the light, appear to have ſomewhat of a golden hue; the ſides are ſpotted with yellow, and the belly is white. It has duſky ſpots, and reddiſh lines on the tail, eſpecially towards the corners.

The Pike will ſwallow other fiſh which are almoſt as large as itſelf; not even excepting thoſe of their own kind. Innumerable are the inſtances mentioned by authors of the voracity of this fiſh. Mr. Pennant informs us of a Pike being choaked, by attempting to ſwallow one of its own ſpecies, that proved too large a morſel. It will devour the water-rat, and draw down the young ducks as they are ſwimming on the water. At lord Gower's canal at Trentham, a Pike ſeized the head of a ſwan, as it was feeding under water, and gorged ſo much of it as killed them both. Geſner indeed relates an inſtance that borders a little on the marvellous. He tells us, that a famiſhed Pike on the Rhine ſeized on the lips of a mule that was brought to water, and that the beaſt drew the fiſh out before it could diſengage itſelf.

The longevity of the Pike is very remarkable. Rzaczynſki tells of one that was ninety years of age; and Geſner ſays, that in 1497 a Pike was taken near Hailbrun, in Suabia, with a brazen ring affixed to it, on which were the following words in Greek characters: "I am the fiſh which was firſt of all put into this lake by the hands of the governour of the univerſe, FREDERICK the Second, the 5th of October 1230;" ſuppoſing this to be a fact, the fiſh was at leaſt two hundred and ſixty-ſeven years of age.

Their uſual time of ſpawning is in March, and ſometimes ſooner if the ſpring is forward. They are exceedingly prolific, forty-eight thouſand eggs having been found in one of their roes. They are in ſeaſon all the year, except in ſpawning time, and about ſix weeks after it. The fleſh is firm, white and ſweet; but if the fiſh exceeds ten or twelve pounds in weight, it has a rankiſh flavour.

The Pike is good and nouriſhing food, and agrees at all times, but eſpecially in winter, with any age and conſtitution. Some authors pretend, that it is hard of digeſtion, heavy in the ſtomach, and always affords bad juice; but theſe qualities are only applicable to ſuch as live in ponds, and marſhy places, and feed upon ſlime and mud. Jovius thinks the Pike has but an ordinary taſte, and Auſonius does not eſteem it; but its taſte differs according to the country in which it is bred. The roe provokes vomiting, and ſometimes purges violently. The Pike contains much oil, and volatile ſalt.

Mr. Lee, of Thelwell in Cheſhire, had ſtored a pit; but when he laded it, in expectation of catching a great number of fiſh, to his diſappointment he found only a large lean Pike, which had devoured all the ſtore-fiſh, and had in his ſtomach a water-wagtail, and a young throſtle, which were ſuppoſed to have been hopping on a twig near the water.

A Pike catched in Barn-meer (a large ſtanding water in Cheſhire,) was an ell long, and weighed thirty-five pounds; it was preſented to lord Cholmondeley, who ordered it to be put into a canal in the garden, wherein were abundance of ſeveral ſorts of fiſh. About twelve months after, his lordſhip drawed the canal, and found that this overgrown Pike had devoured all the fiſh, except one large carp, that weighed between nine and ten pounds, and that was bitten in ſeveral places. The pike was then put into the canal again, together with abundance of fiſh with him to feed upon, all which he devoured in leſs than a year's time; and was obſerved by the gardener and workmen there to take the ducks, and other water fowl, under water; whereupon they ſhot magpies and crows, and threw them into the canal, which the Pike took before their eyes: of this they acquainted lord Cholmondeley, who thereupon ordered the ſlaughterman to fling in calves bellies, chickens guts, and ſuch like garbage to him to prey upon; but being ſoon after neglected, he died, as ſuppoſed for want of food.

In the ſtew for preſerving fiſh, at John Egerton's,

Eſq; at Tatton in Cheſhire, a large Pike was taken out, when there appeared at his mouth the tail of a fiſh, which being pulled out, proved to be another Pike, weight one pound, and was then alive.

In 1730, whilſt Peter Bold, of Bold, in Lancaſhire, was netting ſome pits in Burton-wood, he ſaw a Pike lying amongſt the weeds. Mr. Ralph Taylor, a gentleman who accompanied him, twice attempted to ſeize the Pike, but it eſcaped. Afterwards the pit was drawn, and a tench about five pounds weight pulled out; and ſo was this pike, with the tail of another hanging out of its mouth, which being meaſured with the other, proved nearly of equal ſize.

About the year 1740, when Robert Hyde of Coſnal, Eſq; came of age, he had a large company of gentlemen to dine with him, to whom a fiſherman brought three Pikes, one of twenty-three pounds, another of twelve pounds, and a third of four pounds, which he had caught by trolling in the Weaver: that of twelve pounds appeared in many places to have been bit, which he thus accounted for. Whilſt he was drawing the fiſh to land, it was laid hold of by a larger Pike, which ſtuck faſt, and was landed, but then quitted his hold and got away.

The Pike delights in a quiet, ſhady, unfrequented water, and lurks in the midſt of weeds, flags, or bull-ruſhes: yet he frequently makes excurſions from thence, and ranges about in ſearch of prey: in cold weather he lies deep, and near the bottom, but as the weather grows warm he frequents the ſhallows. In a very hot, clear, ſultry day, he may be ſeen lying on the ſurface of the water, but then you cannot tempt him with any bait. His beſt biting time is early in the morning and late in the evening, when there is a briſk wind, and where the water is clear. If they bite at all, they will take the bait at firſt; it is therefore uſeleſs to throw it often in the ſame place. He will take any ſort of bait, except a fly; but the principal are young roach, dace, gudgeons, minnows, loaches and bleak: in July young frogs and Salmon-ſmelts are proper; and in winter the fat of bacon. Your baits in general ſhould be freſh, ſweet and clean, and if you expect to catch large ones, your baits muſt not be too ſmall, otherwiſe you may ſpend a great deal of time to little purpoſe.

The beſt of the water-frogs for a Pike is the yelloweſt that can be got: and that your frog may continue long alive, put your hook into its mouth and out at his gills, and then with a fine needle and ſilk faſten the upper part of his leg with only one ſtitch to the arming-wire of your hook, or tie it gently above the upper joint to the armed-wire, being careful to hurt him as little as poſſible. There are ſeveral ways of fiſhing for a Pike, but the principal are trowling, trimmer-angling, and ſnap-angling.

In trowling, the line ſhould be made of green ſilk, or thread, and ſhould be forty yards long, or upwards, if the river is broad. Very great care ſhould be taken that your line may run freely out; for if it knots, or entangles, and by that means checks the motion of the Pike as he runs away with the bait, he will let it go, and will not be prevailed upon to take it again very ſoon, unleſs he be extremely hungry. When you have fixed your bait on your hook, with as little damage to it as poſſible, caſt it up and down ſuch places as you imagine the Pike frequents, letting it ſink a conſiderable depth before you pull it up again. When the Pike comes, you may ſometimes perceive by a motion in the water, or at leaſt you may feel him, which is the ſame thing. When this happens, your buſineſs is to give him line enough, that he may have free ſcope to go where he pleaſes, without the leaſt check, for the reaſons above-mentioned. When he is got into his hold, there let him lie till you perceive the line move, and then you may conclude he has pouched the bait; then wind up your line till you think it is almoſt ſtraight, and with a nimble jerk, contrary to the way the Pike takes, hook, and land him as ſoon as you can.

A trimmer is made uſe of in the ſtill part of a river, or in a pond, meer, or canal. Your bait, which ſhould be a young roach, dace, or gudgeon, may hang about mid-water, and may be left to itſelf while you are fiſhing e'ſewhere. By this artifice one perſon may do as much execution as if he had a companion along with him, with little or no additional trouble to himſelf.

A ſnap is generally two large hooks placed back to back, and a perch-hook in the middle to hang your bait upon. When you make uſe of it, take a gudgeon, dace, or ſmall roach, and fix it to the ſmall hook, by running it under the back fin; then let it ſwim down the current, and when you perceive the float to be drawn under water, you may conclude the Pike has laid hold of it; therefore give it a ſmart jerk, and without giving him time to play, keep your line always ſtraight, drawing him towards the ſhore as ſoon as you can, without breaking your tackle, and then with your landing-net throw him out of the water. It will always be the moſt prudent method to have gimp or braſs wire next your hook, and your line to be rather ſhorter than the rod.

Obſerve, that in trowling, the head of the bait-fiſh muſt be at the bent of the hook, and muſt come out at or near his tail. But the eſſential difference between theſe two methods is, that in the former, the Pike is always ſuffered to pouch or ſwallow the bait; but, in the latter, you are to ſtrike as ſoon as he has taken it.

The common trowling hook, for a living bait, conſiſts of two large hooks, with one common ſhank, made of one piece of wire, of about three quarters of an inch long, placed back to back, ſo that the points may not ſtand in a right line, but incline ſo much inwards, as that they, with the ſhank, may form an angle, little leſs than equilateral. At the top of the ſhank is a loop, left in the bending, the wire to make the hook double, through which is put a ſtrong twiſted braſs-wire, of about ſix inches long; and to this is looped another ſuch link, but both ſo looſe, that the hook and the lower link may have room to play: to the end of the line faſten a ſteel ſwivel.

There is however a ſort of trowling-hook different from that already deſcribed, and to which it is thought preferable, which will require another management; this is no more than two ſingle hooks tied back to back, with a ſtrong piece of gimp between the ſhanks; in the whipping the hooks and the gimp together make a ſmall loop, and take into it two links of chain of about an eighth of an inch diameter; and into the lower link, by means of a ſmall ſtaple of wire, faſten by the greater end a bit of lead, of a conical figure, and ſomewhat ſharp at the point. Theſe hooks are to be had at the fiſhing-tackle ſhops, ready fitted up. This latter kind of hook is to be thus ordered, *viz.* put the lead into the mouth of the bait-fiſh, and ſew it up; the fiſh will live ſome time, and will ſwim with near the ſame eaſe as if at liberty. But if you trowl with a dead-bait, as ſome do, let the ſhank be about ſix inches long, and leaded from the middle as low as the bent of the hook, to which a piece of very ſtrong gimp muſt be faſtened by a ſtaple, and two links of chain; the ſhank muſt be barbed like a dart, and the lead a quarter of an inch ſquare: the barb of the ſhank muſt ſtand like the fluke of an anchor, which is placed in a contrary direction to that of the

the ſtock. Let the gimp be about a foot long, and fix a ſwivel to the end of it. To bait it, thruſt the barb of the ſhank into the mouth of the bait-fiſh, and bring it out at his ſide near the tail; when the barb is thus brought through, it cannot return, and the fiſh will be perfectly ſtraight; a circumſtance that renders the trouble of tying the tail unneceſſary.

There is alſo another ſort of trowling-hook, which is, indeed, no other than what moſt writers on this ſubject have mentioned; but the others here deſcribed are late improvements; and this is a hook either ſingle or double, with a long ſhank, leaded about three inches up the wire with a piece of lead about a quarter of an inch ſquare at the greater or lower end: fix to the ſhank an armed wire about eight inches long; to bait this hook, thruſt your wire into the mouth of the fiſh, quite through his belly, and out at his tail, placing the wire ſo as that the point of the hook may be even with the belly of the bait-fiſh; and then tie the tail of the fiſh with ſtrong thread to the wire. Some faſten it with a needle and thread, which is a neat way. Both with the trowl, and at the ſnap, cut away one of the fins of the bait-fiſh cloſe at the gills, and another behind the vent on the contrary ſide; which will make it play the better. The bait being thus fixed, is to be thrown in, and kept in conſtant motion in the water, ſometimes ſuffered to ſink, then gradually raiſed; now drawn with the ſtream, and then againſt it; ſo as to counterfeit the motion of a ſmall fiſh in ſwimming. If a pike is near, he miſtakes the bait for a living fiſh, ſeizes it with prodigious greedineſs, goes off with it to his hold, and in about ten minutes pouches it. When he has thus ſwallowed the bait, you will ſee the line move, which is the ſignal for ſtriking him; do this with two jerks, and then play him. Chuſe to trowl in clear, and not in muddy water, and in windy weather, if the wind be not eaſterly. Some uſe in trowling and ſnapping, two or more ſwivels to their line; by which means the twiſting of the line is prevented, the bait plays more freely, and, though dead, is made to appear as if alive; which, in rivers, is doubtleſs an excellent method: but thoſe who chuſe to fiſh in ponds, or ſtill waters, will find very little occaſion for more than one.

The Pike is alſo to be caught with a minnow; for which method obſerve the following directions. Get a ſingle hook, ſlender, and long in the ſhank; let it reſemble the ſhape of a ſhepherd's crook; put lead upon it, as thick near the bent as will go into the minnow's mouth: place the point of the hook directly up the face of the fiſh; let the rod be as long as you can properly manage, with a line of the ſame length, caſt up and down, and manage it as when you trowl with any other bait: if, when the Pike has taken your bait, he runs to the end of the line before he has gorged it, do not ſtrike, but hold ſtill only, and he will return back, and ſwallow it: but if you uſe that bait with a trowl, it is preferable to all others. When you have ſtruck him, be ſure to have your line ready and ſlack, that he may take as much liberty as he will: for when he finds himſelf trepanned with the hook, he will exerciſe all his ſtrength and cunning to get looſe. As you feel him come eaſily towards you, you may be ſtill drawing, till you feel him make reſiſtance again: then let him have his ſwing till his fury is over; after which gather your line to you again till he ſtarts away; and if you can get him to the top it will ſooner tire him: for the more he ſtrives and throws himſelf from you, the ſooner he will be weary. After this manner, by drawing him up, and letting him looſe again, you may tame him till you bring him to ſhore, and land him by the net. But if you are unprovided with this convenience, beware of attempting to take him out by the back or tail, but graſp him by the head, and put your fingers into his eyes. If you lay hold by his gills, your fingers may be injured with his bites.

The Pike is common in moſt of the lakes of Europe, but the largeſt are thoſe taken in Lapland.

The SEA PIKE.

This fiſh is alſo known by the name of the Sea-Needle: its form reſembles that of the river Pike, but is proportionably longer and rounder. It is covered with ſmall ſcales, and has an oblong conical ſnout. The colour of the inſide of the mouth is between a yellow and a purple, and the jaws and tongue are furniſhed with teeth. The eyes, which are large, have each a ſilver coloured iris: the noſtrils are wide and round. The tail is forked. The Sea Pike is an inhabitant of the Mediterranean.

NATURAL HISTORY of the ARGENTINE.

THIS is a ſmall fiſh of a ſlender form, not unlike that of the pike. The back is green, and the ſides, beneath the lateral line, are ſilvery. The noſe is ſharp-pointed, the eyes large, and the teeth very minute; the head is ſo tranſparent, that the brain may be ſeen thro' the ſkull. It is however principally diſtinguiſhed from all other fiſh by the air-bladder, which is conical at both ſides, and outwardly appears as if it was covered with poliſhed leaf ſilver. This is uſed in the manufacture of artificial pearl. This fiſh is often ſeen in the fiſh-markets at Rome.

NATURAL HISTORY of the MULLET.

THE form of a Mullet reſembles that of a dace: the head is almoſt ſquare, and flat at the top; the noſe is ſharp, and the lips thick. It has large ſcales, not only on the body, but alſo on the head, and the covers of the gills. The back is of a bluiſh brown, and the belly white. The lateral lines are variegated alternately with black and white. The eyes have no other ſkin than their own coats, and the forward back-fin is radiated with five long ſpines. The mouth is deſtitute of teeth, but the tongue is roughiſh; and there are two rough bones on each ſide of the palate. This fiſh has alſo a bone beſet with prickles, at each corner of the mouth: when at its full growth, it is about eighteen inches long. It viſits the rivers in the ſouthern parts of England, in the beginning of the ſummer with every tide, and returns back when the water ebbs. Thoſe taken near Arundel, in Suſſex, are ſaid to be much ſuperior to any others. The Mullet is an excellent fiſh for the table.

Mullets generally come in great ſhoals, and keep rooting in the ſand or mud, like hogs. They are very ſagacious, and when ſurrounded with a net, the whole ſhoal frequently eſcapes by leaping over it; for when one takes the lead, the others immediately follow. Oppian takes notice of this circumſtance, and his obſervations are thus tranſlated by Jones.

The Mullet, when encircling ſeines incloſe,
The fatal threads and treach'rous boſom knows,
Inſtant he rallies all his vig'rous pow'rs,
And faithful aid of ev'ry nerve implores;
O'er battlements of cork updarting flies,
And finds from air th'eſcape that ſea denies.
But ſhould the firſt attempt his hopes deceive,
And fatal ſpace th' impriſoned fall receive,
Exhauſted ſtrength no ſecond leap ſupplies;
Self-doom'd to death the proſtrate victim lies
Reſign'd, with painful expectation waits,
Till thinner elements complete his fates.

The Mullet was in great eſtimation among the Romans, and bore an exceeding high price. The price given for one in the days of Juvenal and Pliny is a ſtriking evidence of the luxury and extravagance of that age.

The laviſh ſlave
Six thouſand pieces for a Mullet gave,
A ſeſterce for each pound. DRYDEN.

Aſinius Celer, however, a man of conſular dignity, was infinitely more laviſh than the epicure mentioned by Juvenal; for he gave eight thouſand mummi, or ſixty-four pounds eleven ſhillings and eight-pence, for a fiſh of ſo ſmall a ſize as the Mullet. Such indeed was the luxury of the times, that there were ſtews in the eating-rooms, ſo that the fiſh could at once be brought from under the table and placed upon it; they even put the mullets in tranſparent vaſes, that they might be entertained with the various changes of its colour while it lay expiring.

CHAP. V.

Containing the NATURAL HISTORY *of the* FLYING FISH, *the* HERRING, *the* PILCHARD, *the* SPRAT, *the* ANCHOVY, *the* SHAD, *the* CARP, *the* BARBEL, *the* TENCH, *the* GUDGEON, *the* BREAM, *the* BUD, *the* ROACH, *the* DACE, *the* CHUB, *the* BLEAK, *the* WHITE BAIT, *the* MINNOW, *the* GOLD FISH, *the* LOBSTER, *the* CRAB, *the* TORTOISE, *the* TURTLE, *the* SEA SNAIL, FISHES *of the* OYSTER KIND, *and the* SEA URCHIN.

NATURAL HISTORY of the FLYING FISH.

IN ſhape and colour the Flying Fiſh nearly reſembles that of a herring, but the eyes are larger in proportion. It has two pair of fins like wings; the greater of which are placed a little behind the gills, and the leſſer about the region of the vent. The wings before are preceded with a ſmall fin of ſix rays; and the upper part of the wings is of a dirty olive colour; but on the edge they are beautifully painted with round blue ſpots. By the help of theſe wings they ariſe out of the water, and fly a conſiderable way, to avoid the purſuit of the *dolphins* and other fiſhes that would devour them. Some authors ſay that they will fly for two hundred paces together, and fall down when their fins grow dry: in their flight, they go ſometimes on one ſide, ſometimes on the other, and are taken either in the water by gilt-heads, or out of it by ſea-mews or cormorants. They are never taken by fiſhing for them; but will often fly into the ſhips that ſail between the tropics. Nieuhoff ſays, that the Flying Fiſh is bluiſh on the back, but inclining to brown towards the tail; that it has large eyes, broad yellowiſh fins, and in ſhape reſembles the ſmelt. Different authors, ſays a naturaliſt, having given different accounts of this fiſh, renders it highly probable, that there are ſeveral kinds of them. The fleſh of them has a very agreeable flavour, and is very wholeſome; which, very likely, may be the inducement to other fiſhes ſo frequently to purſue it. Mr. Ray affirms, that he has ſeen them frequently in the fiſh-markets at Rome, as well as in the iſlands of Sicily, and Malta, where they are brought for ſale. The ancients were acquainted with this ſpecies: Pliny mentions it under the name of hyrundo, and ſpeaks of its flying faculty.

NATURAL HISTORY of the HERRING.

HERRINGS differ greatly in ſize, but the uſual length is from nine inches to a foot. The colour of the back and ſides is green, varied with blue, and the belly is ſilvery. What principally diſtinguiſhes this fiſh from all others, is a ſcaly line that runs along the belly from the head to the tail. The ſcales are large, thin, and fall off with a ſlight touch. It has no ſpots, and the belly is ſharp like a wedge. The eyes are very large; the edges of the upper jaw and the tongue are very rough, but the whole mouth is void of teeth: the gill covers are very looſe, and open wide; which occaſions the immediate death of the fiſh when taken out of the water; whence the proverb ariſes, *as dead as a herring*. The tail is forked, and the ſwimming-bladder is of a ſilver colour.

The fleſh of the herring is in great eſteem, being fat, ſoft, and delicate; eſpecially if it is dreſt ſoon after it is taken.

Herrings are met with in vaſt ſhoals on the coaſt of America, as low as Carolina: they are alſo extremely numerous in the ſeas of Kamtſchatka. Their great winter rendezvous is within the arctic circle; where they continue ſeveral months in order to recruit themſelves after the fatigue of ſpawning; the ſeas within that ſpace ſwarming with inſect food, in a much greater degree than in our warmer latitudes.

Herrings begin to appear off the Shetland Iſles in April and May; but the grand ſhoal make their appearance in June. Their number is ſo immenſe as to alter the appearance of the very ocean. They are divided into diſtinct columns of five or ſix miles in length, and three or four in breadth, and they drive the water before them with a kind of rippling: ſometimes they ſink for a few minutes, then riſe again to the ſurface, and in fine weather reflect a variety of ſplendid colours.

Towards the end of June, Herrings are in full roe, and they continue in perfection till the beginning of winter, when they begin to depoſit their ſpawn. The young Herrings approach the ſhores in July and Auguſt, and are then from half an inch to two inches in length. Very few young Herrings being found in our ſeas during winter, it is imagined, that they muſt return to their parental haunts beneath the ice, to repair the vaſt deſtruction of their race during ſummer, by men, fowl, and fiſh. Some few of the old herrings continue on our coaſts the whole year, but their number is very inconſiderable.

The Herring fiſhery is of great antiquity: the Dutch firſt engaged in it about the year 1164: their diligence and ſkill gives them a ſuperiority over us in that branch of trade even at this day; it is nevertheleſs a conſiderable article among the Engliſh. Yarmouth has long been famous for its Herring fair, which was regulated by an act in the 31ſt of Edward the Third: that town is obliged, by its charter, to ſend to the ſheriffs of Norwich one hundred Herrings, to be made into twenty-four pies,

by them to be delivered to the lord of the manor of East Carleton, who is to convey them to the king.

This valuable fishery has not escaped the attention of the present generation. By the 28th of Geo. II. c. 14. it is enacted, that if any person shall damnify or destroy, without the consent of the Society of the Free British Fishery, any of the nets, sails, cordages, stores, or other materials, belonging to the said society, he shall forfeit to the society treble value by distress; and for want of distress, to be committed to the house of correction for three months.

Immense quantities of these fish are annually taken, many of which are consumed whilst they are fresh, and the rest are salted, pickled, or smoak-dried, and are an edible article all over Europe.

Fresh Herrings, considered as a food, are said to be very good aliment, if used moderately; but, taken in quantities disproportioned to the powers of digestion, they produce a putrefaction in the stomach, of the alcaline kind, and are attended with very bad consequences. But pickled Herrings are very bad aliment, the flesh being rendered hard, and scarcely digestible by the vital powers. These, however, are less injurious than those that are salted and dried; these last being more hardened, and consequently less easily digested.

It was a question formerly, whether Herrings fed upon any thing besides water? but Lewenhoeck has made it evident, that they come every year in pursuit of worms and small fish, which at the time of their arrival abound in the channel; for when they have cleared the northern seas of their stock of provisions, then they travel southward, in search of a fresh supply.

The Dutch begin their Herring fishery on the 14th of June, in which they employ no less than a thousand vessels. These vessels are a kind of barks, called busses, carrying from forty-five to sixty ton, and two or three small cannon. None of them are allowed to stir out of port without a convoy, unless they carry twenty pieces of cannon among them all, in which case they are permitted to go in consort. Before they set out, they make a verbal agreement, which has the same force as if it was in writing. The regulations of the admiralty of Holland are in a great measure followed by the French, and other nations: the principal are, that no fisher shall cast his net within a hundred fathom of another's boat: that while the nets are cast, a light shall be kept on the hind part of the vessel: that when a boat is by any accident obliged to leave off fishing, the light shall be cast into the sea: likewise, that when the greater part of the fleet leaves fishing, and casts anchor, the rest shall be obliged to do the same.

The best times of fishing on the coast of Norfolk and Suffolk, near Yarmouth, Lestoffe, and Southwold, are from the middle of September till the middle of October. The nets that they use are about five yards deep, and twenty-five yards long: they sometimes fasten so many of these nets together as will take a mile in compass. They judge whereabouts the herrings lie by the hovering and motion of the sea-birds, which continually pursue them in expectation of prey. The fishers, as they row gently along, let their nets fall into the sea, taking their course as nearly as they can against the tide, that so when they draw their nets they may have the assistance of the tide. As soon as any boat has got its load, it makes to the shore, and delivers the Herrings to the man who is to wash and gut them. They distinguish their Herrings into six different sorts, as the fat Herring, which is the largest and thickest of all, and will keep about two or three months; the meat Herring, which is likewise large, but not so thick nor so fat as the former; the night Herring, which is of a middle size; the pluck, which has received some damage from the nets; the shotten Herring, which has lost its milt or spawn; and the copshen, which by some accident or other has been deprived of its head. All these Herrings are put into a tub with salt or brine, where they lie for twenty-four hours; when they are taken out and put into wicker baskets, and washed; after this they are spitted on small wooden spits, and hung up in a chimney built for that purpose, at such distances that the smoke may have free access to them all. When they have filled these places, which will hold ten or twelve thousand, they kindle the billets, which are laid on the floor, in order to dry them: this done, they shut the doors, all other air-holes being stopt before, and immediately the place is filled with smoke. This is repeated every quarter of an hour, insomuch, that a single last of Herrings requires five hundred billets to dry them. A last is ten barrels, each barrel containing near a thousand Herrings. These, thus prepared and dried, are called red Herrings.

The pickled Herrings are best done by the Dutch, who take them for that purpose about the summer solstice. The usual method of pickling them is this: as soon as the Herrings are taken out of the sea they are gutted and washed: then they are put into a strong brine, made with water and sea-salt, for fifteen hours; after this, they are taken out and well drained, and put in a regular order into barrels, with a layer of salt at the bottom of the barrel, and another at the top. Then take care to stop them up carefully that no air may get in, nor brine out, either of which would be prejudicial to the fish.

NATURAL HISTORY of the PILCHARD.

THE Pilchard greatly resembles the Herring, but differs from it in some particulars; it is a third part less, and the body is proportionably broader: it has a black spot near the upper corner of the gills, and the belly is not so sharp. It has no teeth, either in the jaws, the tongue, or the palate.

Pilchards appear in vast shoals off the Cornish coasts about the middle of July, and disappear at the beginning of winter; though a few of them sometimes return again after Christmas. This fishery employs a great number of men on the sea; and men, women, and children, on land, in salting, pressing, washing, and cleaning; in making boats, nets, ropes, casks; and all the tradesmen depending on their construction and sale. The usual quantities exported *each* year, for ten years, from 1747 to 1756, inclusive, on the average, is as follows: Fawy has exported 1732 hogsheads, annually; Falmouth, 14,631, and one third; Penzance and Mount's Bay, 12,149, and one third; St. Ives, 1,282: in all amounting to 29,795 hogsheads.

NATURAL HISTORY of the SPRAT.

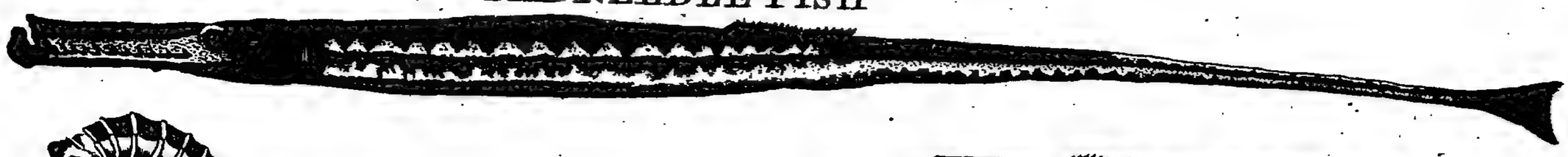
IT was supposed by Mr. Willoughby and Mr. Ray, that Sprats were the fry of the herring or the pilchard, as they exactly resembled either the one or the other in every particular except the size: Mr. Pennant, however, is of a different opinion, and says, that on comparing a Sprat and a young herring of equal size, some specific differences were discovered. He also observes, that the Sprats visit our coasts, and continue with us in shoals innumerable, when the young herrings have, in general, retired to the great northern deeps.

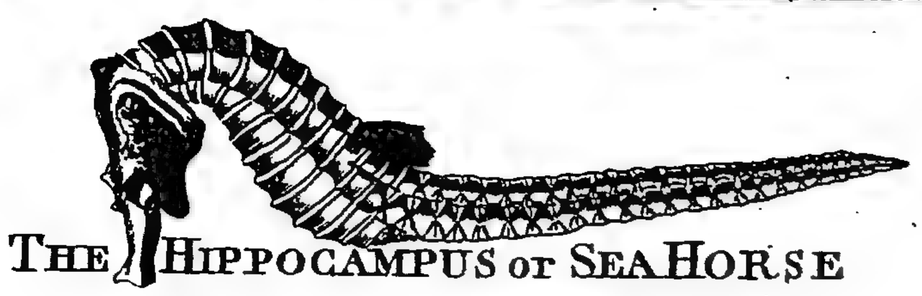
Sprats appear below bridge in the river Thames, early in November, and leave it in the month of March, and are, during that season, a great relief to the poor of the metropolis.

The Sprat seldom exceeds the length of five inches;

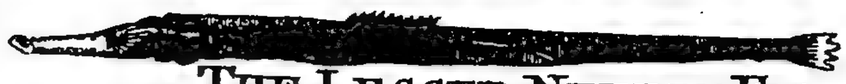
FISHES.

THE NEEDLE FISH





THE HIPPOCAMPUS or SEA HORSE

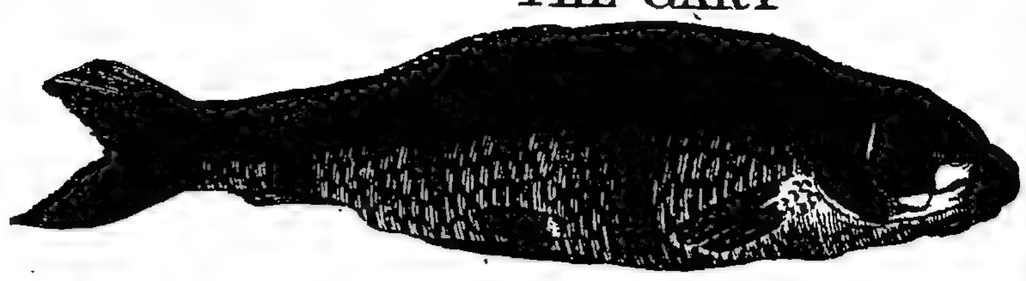


THE LESSER NEEDLE FISH

THE BEARDED LOACHE

THE LOACHE

THE GUDGEON



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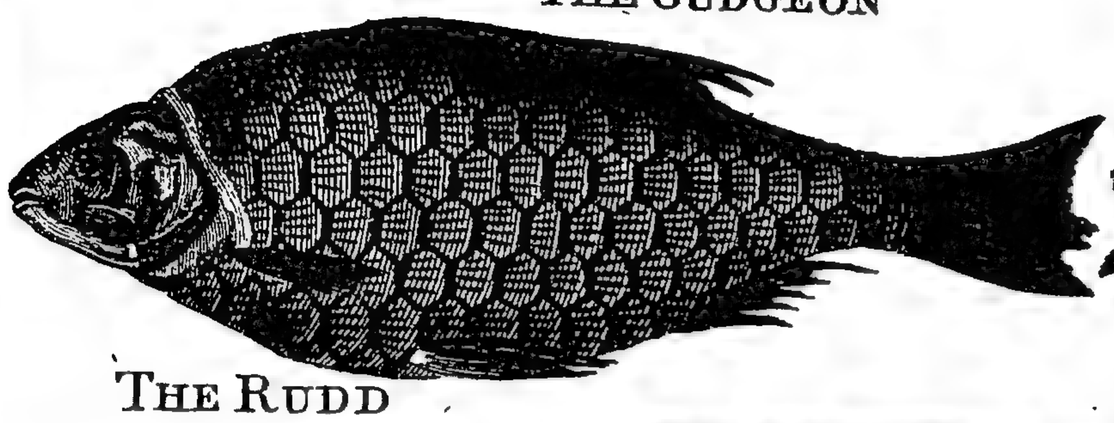
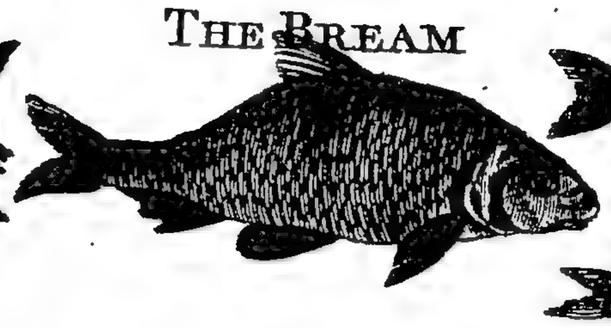


THE RUDD



THE BREAM

THE CHUB

THE LAKE BLEAK

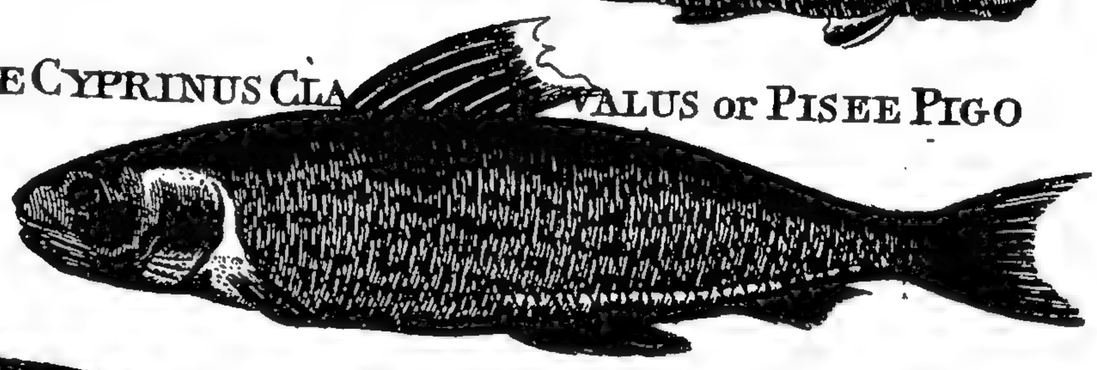
THE SARFE

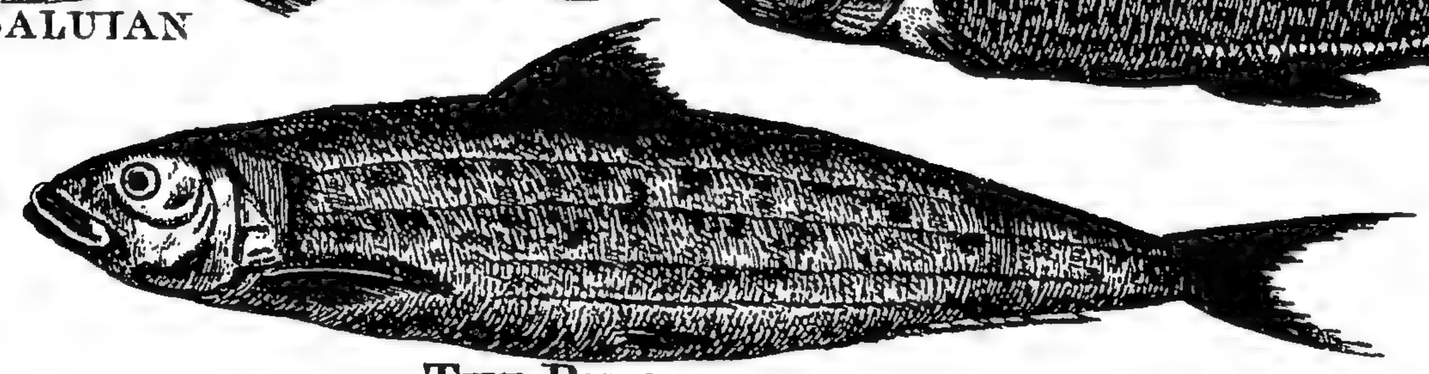
THE ROACH

THE NASUS

THE SQUALUS or SALUIAN

THE CYPRINUS CLA VALUS or PISEE PIGO

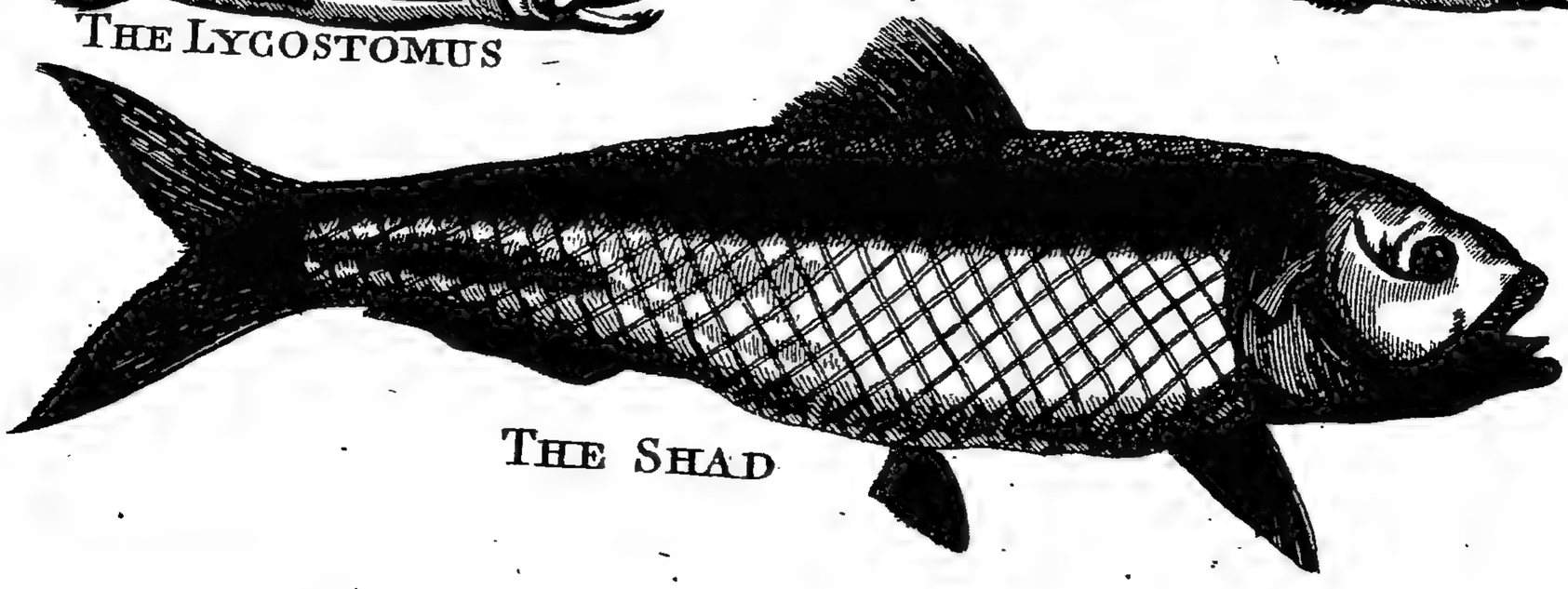




THE PILCHARD

THE LYCOSTOMUS

THE ANCHOVEY



THE SHAD

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Eastgate sculp.

inches; and the body is proportionably deeper than that of a herring.

Natural History of the ANCHOVY.

THE Anchovy is about a palm in length, and almoſt of the colour of a ſprat. The true Anchovies are taken in vaſt quantities in the Mediterranean, and are brought over here pickled. The body is rounder, and not ſo compreſſed as that of the herring: they are alſo tranſparent, except where the ſpine of the back prevents it: they have a ſharp noſe, and the upper jaw is longer than the lower: the mouth is extremely wide in proportion to the ſize of the fiſh: the eyes, and the apertures of the gills, are alſo very large. The Anchovy has this peculiar property, that it will diſſolve in almoſt any liquor, when it is ſet over the fire.

There is a fiſh ſometimes taken in the ſea near Cheſter, which Mr. Ray, and ſome others, ſuſpected to be the anchovy; but it is different from thoſe taken in the Mediterranean.

The GOLDEN ANCHOVY.

This is an Eaſt Indian fiſh, and is ſo called on account of its ſhining golden colour. The mouth, which is very large and long, is armed with ſharp teeth: the body is long, and almoſt as ſlender as that of the eel.

Natural History of the SHAD.

THE Shad differs from the herring in being broader, thinner, and more compreſſed on the ſides: it is alſo larger than the herring, the general ſize being three or four pounds; though they ſometimes weigh ſeven or eight pounds. On each ſide, near the gills, it has a large round black ſpot, and ſix or ſeven ſmall ones, placed in a right line towards the tail; in which particular it agrees with the pilchard. The Shad enters the mouths of rivers, which herrings never do. The Severn affords the Shad in higher perfection than any other river. This fiſh makes its firſt appearance in April and May, according to the temper of the air: in very warm ſeaſons it is always ſeen in April, and uſually continues in the river about two months. The Severn Shad is a very delicate fiſh about the time of its firſt appearance, eſpecially in that part of the river near Glouceſter. The Thames Shad is reckoned a very coarſe inſipid fiſh: it does not frequent that river till the month of July. There is indeed ſo great a difference between the Thames Shad, and that of the Severn, that they can hardly be conſidered as the ſame fiſh.

Natural History of the CARP.

THE colour of the Carp, eſpecially when full grown, is yelloviſh, and the ſcales are large: the head is ſhort, like that of the tench, and the mouth is of a middling ſize, with fat fleſhy yellow lips. It has no teeth in the jaws or on the tongue, but it has a triangular bone in the palate, and two other bones in the throat, which anſwer the purpoſe of teeth. It has a ſingle barb on each ſide of the mouth, and another above thoſe, which is ſhorter: the fins are large; the tail is broad, a little forked, and of a reddiſh black colour: the lateral line is ſtraight, and paſſes through the middle of each ſide.

There were no Carps in our ponds or rivers, till they were introduced here by Leonard Maſchal, about the year 1514. Ruſſia has none of theſe fiſh at this day; Sweden has them only in the ponds of the people of faſhion; but they abound in the rivers and lakes of Poliſh Pruſſia, where they are taken of a vaſt ſize. They are there a great article of commerce, and are ſent in well-boats to Ruſſia and Sweden.

Pliny ſays it lives in the ſea; and we are credibly informed, that Carps are ſometimes found in the harbour of Dantzick. They are very long lived. Geſner affirms, that he knew a man of good reputation, who aſſured him he had ſeen one of an hundred years old. They alſo grow to a very great ſize: a Carp was taken in the river Thames, near Hampton-court, that weighed thirteen pounds. Jovius ſays, Carps were ſometimes caught in the Lacus Larius, of two hundred pounds weight; and, according to Rzaczynſki, others have been taken in the Dnieſter, which were five feet in length. They are extremely tenacious of life, and have been kept alive out of water upwards of a fortnight, by being wrapped up in wet moſs, with the mouth only remaining out. It ſhould be hung up in a cool place, fed with bread and milk, and ſometimes plunged into the water. By this treatment they grow fatter, and have a finer flavour than thoſe which are immediately killed from the pond.

The Carp is a prodigious breeder: the roe has ſometimes been taken out, and weighed with the fiſh itſelf, when the former has been found to preponderate. The Carp has perhaps the longeſt ſcales of any fiſh, in proportion to its bulk. Some of theſe are brown, and others yellow and white: the brown colour prevails in the largeſt ſcales; the middle are of a yellow and gold colour; but the white are ſmall and ſilvered.

The fleſh of the river Carp is much better than that of the pond, and in general it is more or leſs wholeſome, according to the nature of the water in which they are bred, and conſequently muddy ſtinking ponds produce the worſt fiſh. It is ſoft, inſipid, and not entirely free from viſcidity. But curious eaters value it chiefly for the palate, or tongue, as they call it. The river Carp is not fond of a rapid ſtream, but delights in a ſtill deep water, with a marly, or clayey bottom, eſpecially if there be green weeds, which he is extremely fond of. A Carp exerciſes the angler's patience as much as any fiſh, for he is very ſly and wary. They ſeldom bite in cold weather, and, in hot, a man cannot be too early or too late for them. But when they do bite, there is no fear of their hold.

Proper baits are the red-worm in March, the cadew in June, and the graſshopper in July, Auguſt, and September. But a recent diſcovery has proved a green-pea to be a bait inferior to none, if not the beſt of all; and that the beſt method to prepare them for uſe, is by half-boiling a ſufficient quantity, and covering them with melted butter. In hot weather, he will take a lob-worm at top, as a trout does a fly: or, between the weeds, in a clear place, ſink it without a float, about eight inches in the water, with only one large ſhot on the line, which is to be lodged on the leaf of ſome weed: then retire, keeping your eye upon the ſhot, till you ſee it taken away, with about a foot of the line, and then you may venture to ſtrike; but keep him tight, and clear of the weeds. Great numbers of Carp have been taken in this manner.

In ponds, the beſt method is to throw ſix or eight ſlices of bread, to be carried with the wind, and in a ſhort time, it is probable, you will ſee many fiſh feeding on it: if not, crumble a little very ſmall, and caſt it in where the ſlices reſt; which will be a means to make them find the pieces at top; and after ſuffering them to feed on it, take a very long rod, a ſtrong line, a middle ſized hook, and one ſhot fixed juſt above the hook, and baited with about the ſize of a large

large horſe-bean of the upper-cruſt of a raſped French roll, and you may pick out what ſize and quantity you pleaſe, by dropping your bait before the largeſt fiſh, as he is feeding on the ſlices at the top. This is a ſure means of getting ſport, and but little known. This fiſh, as already obſerved, is very cautious, and therefore your float muſt be ſmall, and you muſt be ſure to keep out of ſight. And becauſe when hooked he ſtruggles in a violent manner, you muſt take care that your tackle be very good and ſtrong, otherwiſe he will break from you.

Having fixed upon a place which you think a proper harbour for Carp, you ſhould plumb your ground over-night, in order to find the depth of the water. Likewiſe at the ſame time bait the place with ſmall bits of congealed blood, boiled malt, wheat, or rye, mixed with bran. The next morning early repair to the place as gently as you can, taking care, as mentioned above, to keep out of ſight; when you have a bite, let the float ſail away before you ſtrike, and then do it ſtrongly, and the contrary way to the motion of the float, and there will be leſs danger of pulling the bait out of the fiſh's mouth. When you have hold of him, if your tackle is good, you need not fear loſing him, for he ſeldom breaks his hold. When you angle for a Carp, you ought not to forget your landing-net, which is by much the ſafeſt way of taking him out; otherwiſe play the fiſh till you draw it to the ſhallows, where you may fix your rod upright in the ground, at a proper diſtance from the river, and, putting both your hands under the fiſh, throw it on the ſhore.

If you are deſirous of angling with a paſte, the following is as good as any: take fine flour, a bit of lean raw veal, a little honey, and cotton-wool ſufficient to keep the ingredients together, and beat them in a mortar to a paſte. Or white bread mixed with cotton-wool, and worked into paſte with ſome of the water where you are fiſhing, is not a deſpicable bait. Carp will take red currants, green figs, or almoſt any ſort of bait. When you fiſh with a graſshopper, your muſt take off its wings, and let it ſink into the water without lead or float. Gentles, two upon a hook, and throwing in chewed white bread, is a good method to angle for Carp, eſpecially in a pond.

As the Carp is but indifferent food without excellent ſauce, we beg leave to obſerve, that the following method is in high repute for dreſſing Carp.

Take a Carp, alive if poſſible, ſcour him, and rub him clean with water and ſalt, but do not ſcale him; then open him, and put him, with his blood and liver, into a ſmall kettle; then take ſweet marjoram, thyme, and parſley, of each half a handful, a ſprig of roſemary, and another of ſavoury, bind them into two or three ſmall bundles, and put them to your Carp, with four or five whole onions, twenty pickled oyſters, and three anchovies. Then pour upon your fiſh as much claret as will cover him, and ſeaſon your claret well with ſalt, cloves, mace, and the rinds of oranges and lemons; cover your pot, and ſet it on a quick fire till it be ſufficiently boiled; then take out the Carp, and lay it with the broth into the diſh, and pour upon it a quarter of a pound of freſh butter melted, and beaten with half a dozen ſpoonfuls of the broth, the yolks of two or three eggs, and ſome of the herbs ſhred: garniſh your diſh with lemons, and ſo ſerve it up.

NATURAL HISTORY of the BARBEL.

THE weight of the Barbel is generally about ſeven or eight pounds: though they are ſometimes found of the length of three feet, and eighteen or twenty pounds in weight. The back is of a paliſh olive colour, and the belly is ſilvery: the back and ſides are marked with black ſpots; and the ſhape of the body is long and roundiſh; but the back is ſharp and arched. The ſcales are not large, and the lateral lines run through the middle of the ſides. The ſnout is ſharpiſh, and the mouth is without teeth, like the reſt of this kind. The upper jaw is longer than the lower, and it has two barbs on each ſide; one at the corner of the mouth, and the other on the ſide of the noſe. The eyes are ſmall, and their iris is either of a ſilver or a gold colour, ſpotted with brown. In ſummer their bellies are red. The fleſh is ſoft, flabby, and extremely coarſe: the Barbel is indeed the worſt and coarſeſt of freſh-water fiſh. The roe is very noxious, affecting thoſe who eat of it with a nauſea, vomiting, purging, and a ſlight ſwelling. In ſummer, theſe fiſh move about in the night in ſearch of food; but in autumn and winter they confine themſelves to the deepeſt holes.

The Barbel is bred in moſt rivers; and the Thames, in particular, abounds with them. In the ſummer, he haunts the ſwifteſt and ſhalloweſt ſtreams, where he lurks under the weeds, and works and routs with his noſe in the ſand, like a hog. Yet ſometimes he retires to bridges, flood-gates, locks, and weirs, where the waters are ſwift and deep. He never feeds off the ground, and will take any ſort of worm, bits of bacon, old cheeſe, or new cheeſe, if kept in a linen rag, dipped in honey, two or three days, to make it tough. The watermen, who attend on you when you fiſh in their boats, ſometimes provide graves, to be had at the tallow-chandlers, for a ground bait over night; yet they generally uſe the ſame worm that you bait with. They are very ſubtle, ſtrong fiſh, ſtruggling hard for their lives, and will often pick off your baits.

On the morning of Auguſt 23, 1771, Mr. Warren, the Perfumer, of Marybone-ſtreet, began to angle in Walton Deeps, and found ſuch ſport, that he ſtopped before noon, tired with fatigue, and found that he had caught two hundred and eighty pounds of large ſized Barbel. This gentleman uſually has the Deeps baited with worms over night, and in the morning fiſhes from a well boat, with a perfumed paſte on his hook.

His time of biting is early in the morning, in June, July, and Auguſt, till ten o'clock, and from four in the afternoon, till ſun-ſet; but September and October are to be preferred to any other months, becauſe then they retire to the deep holes. In the ſummer they come to the ſhallows about ſun-ſet, where they may be eaſily taken with a ſcoured lob-worm. Your rod muſt be very ſtrong, with a tough whalebone at the end. You have no occaſion for a float, but muſt put a large bullet on the line, that your bait may lie ledger. You muſt have ten hairs next the hook, but the remaining part of your line muſt be ſilk. If you make uſe of a wheel, as in trout-fiſhing, it will anſwer your purpoſe the better.

The moſt famous places near London, for Barbel angling, are Kingſton-bridge, and Shepperton-deeps; but Walton-deeps, Chertſey-bridge, the ſmall iſle at Brentford, Hampton-ferry, and the holes under Cooper's-hill, are thought to be in no wiſe inferior: you may likewiſe meet with them at all the locks between Maidenhead and Oxford.

NATURAL HISTORY of the TENCH.

THE Tench ſeldom exceeds four or five pounds in weight in this iſland, but in ſome countries it has been found to weigh twenty. It is ſome-

ſometimes called the phyſician of the fiſh, and it is ſaid that the ſkin is ſo healing, that the wounded apply it as a ſtyptic. Mr. Diaper, in his piſcatory eclogues, ſays, that even the voracious pike will ſpare the Tench on account of its healing powers.

The Tench he ſpares a medicinal kind:
For when by wounds diſtreſt, or ſore diſeaſe,
He courts the ſalutary fiſh for eaſe;
Cloſe to his ſcales the kind phyſician glides,
And ſweats a healing balſam from his ſides.

It is a mucous, excrementitious fiſh, which delights in marſhy and muddy waters. As to its medical uſes, it is cut and applied to the wriſts, and ſoles of the feet, in order to mitigate feveriſh heats, and to divert the venom of the peſtilence; in like manner it is applied in pains of the head and joints. Live Tenches, applied one after another to the regions of the umbilicus and liver, and kept there till they die, are ſaid to cure the jaundice; for they contract, it ſeems, a yellow colour.

There are two ſmall ſtones in the head of the Tench, that have an abſorbent, detergent, and diuretic quality. Whatever may be the uſes of its ſlime to the inhabitants of the water, its fleſh is certainly a wholeſome and delicious food to thoſe of the earth.

The Tench has a ſmall head and noſe in proportion to the ſize of the body; which is broad, thick, and ſhort: the colour of the body is duſky; the dorſal and ventral fins are of the ſame colour: the head, ſides, and belly, are of a greeniſh caſt, beautifully mixed with gold, which is in its greateſt ſplendour when the fiſh is in the higheſt ſeaſon. The tail is blackiſh, ſomewhat ſquare, and conſiſts of nineteen rays: the eyes are ſmall, ſeated on the ſides of the head, and the iris is red. The Tench delights in ſtill waters, and is ſeldom found in rivers.

The Tench delights ſo much in ſtanding waters and ponds, and the ſtill parts of rivers, whenever they are found there, for they ſeem to be the natives of ſtanding water. However, they are ſaid to breed in the rivers Stower, in Dorſetſhire, and the Tiber, in Italy. Their time of ſpawning is the latter end of June, or the beginning of July; and they are in ſeaſon from the beginning of September to the end of May. Moſt anglers declare, that this fiſh bites beſt in the three hot months; and yet others have found they will bite at all times, and at all ſeaſons, unleſs after a ſhower of rain, but beſt of all in the night.

The beſt baits for this fiſh are a middling-ſized lob-worm, or red-worm, well ſcoured, a gentle, a young waſp, a grub boiled, or a green grub; or you may uſe the clotted black blood in a ſheep's heart, made with fine flour and honey into the conſiſtence of an unguent; and your bait (when it is a red-worm) anointed with this, is by many preferred to other baits. But ſome have had more ſucceſs with a red-worm dipped in tar, than any other. They bite almoſt in the ſame manner as the pond-carp, and will run away with your float; but when once you have hooked him, you are in no danger of loſing him, if your tackle is but ſtrong enough. The ground bait ſhould be the ſame as for all pond fiſh, that is, either blood, or blood and grains mixed.

When the weather is very warm, you muſt fiſh about mid-water, gently pulling your bait almoſt to the ſurface, and then letting it down as ſlow as poſſible. Be not too eager in ſtriking him when he bites, for as he delights in ſucking the bait, allow him time and he will not quit it. Uſe a ſtrong graſs or gut, and a gooſe-quill float, without a cork, except in rivers, where the cork is always to be preferred.

Fiſh very near the ground; and if you bait with gentles, throw in a few at the taking every fiſh; which will draw them to your hook, and keep them together.

When you angle with a paſte, let a little tar be mixed with it. They bite beſt one hour before and after the ſun riſes and ſets. In hot weather you may ſnare them at the top of the water, as the pike, with a double-wired link, not over-twiſted, hung in a nooſe, tied to a line, on a long rod: let it fall ſoftly before him on the water, without touching him, till you have brought it over his gills; then pull gently, and you have him.

Natural History of the GUDGEON.

THIS fiſh is generally found in gentle ſtreams, and is about five or ſix inches long; with a round body, ſmall ſcales, a brown or olive-coloured back, and a whitiſh belly: the iris is tinged with red; the gill-covers with green and ſilver; and at each corner of the mouth is a ſingle barb. The tail is forked, and both that and the dorſal-fin are ſpotted with black. They bite eagerly to a proverb—hence the poet's obſervation—

What Gudgeons are we men!
Every woman's eaſy prey.

The Gudgeon grows to a much larger ſize in ſome rivers than in others. We have heard of one taken in that near Uxbridge, which weighed a pound. The fleſh is in high eſteem, and thought to be little inferior to that of the ſmelt.

The Gudgeon will bite all day from the end of March till Michaelmas, but not till an hour after ſun-riſe, nor longer than an hour before ſun-ſet. You may ſometimes have full as good ſport an hour after ſun-ſet, as at any time in the day.

The principal baits for the Gudgeon, are the ſmall red-worm, gilt-tail, brandling, and a meadow-worm. He will likewiſe take a gentle, cod-bait, brood of waſps, or cow-dung bob; but the ſmall red worm is what he is the fondeſt of. If you can find a bridge or plank over a ſmall river, chuſe to angle underneath for Gudgeons, for they love the ſhade: and are ſo far from being ſhy, that you may not only appear in ſight, but if you drive them from their place of reſort, they will immediately return. A ſingle hair line, a fine taper rod, a float, and a ſmall hook, is what is in general uſe, and the bait to drag on the ground. When you angle for them in the ſhallows, raiſe up the ſand or gravel with a rake or pole, and it will draw the Gudgeons about your bait; when you have no ſuch conveniency, throw in ſome handfuls of earth. Uſe a float, and let your bait always touch or drag on the ground.

When you angle for them in a boat in the Thames, let the waterman rake the gravel up to draw the Gudgeons about you; then plumb the ground, and bait your hook with a ſmall well-ſcoured red-worm; by this method you will ſeldom fail of good ſport. Your tackle, as for dace, with a well-ſcoured gilt-tail. There have been an hundred dozen, or more, taken at Metwell Weir, in the river Merſey, with angling, in one day; you may uſe two hooks at a line at a time, and two rods is not amiſs; and then you may ſometimes take pearch or trout inſtead of Gudgeons.

Natural History of the BREAM.

THIS is a broad flattiſh fiſh, with a ſmall ſquariſh head, and a ſharp noſe. It is extremely deep and thin in proportion to its length: the top of the head is broad and flat; and the back,

which riſes like that of a hog, is of a duſky blue colour: the belly and ſides are white: the ſcales are large, and the mouth, in proportion to the ſize of the fiſh, is very ſmall, and without teeth: the iris of the eye is of a ſilver colour, and the pupil is ſmall. This fiſh is an inhabitant of lakes, or the deep parts of ſtill rivers. It is extremely inſipid, and conſequently very little eſteemed.

Breams naturally feed upon ſlime, weeds, and dirt; but will take any ſort of paſte, the brood of bees or waſps, flies under water, and cod-baits. But a ſhort well-ſcoured marſh-worm, or a large red-worm, will prove moſt ſucceſsful, or the tail of a well-ſcoured dew-worm, or two or three large brandlings. They bite beſt when there is a breeze of wind, and require a great deal of baiting to keep them together. When the water is rough, your bait muſt be placed within a foot of the bottom. They are uſually found in the deepeſt and broadeſt part of a river, early in the morning, and from three or four in the afternoon, till ſun-ſet, when the weather is warm. They bite very ſlow, and the larger they are, the ſlower. As ſoon as you have ſtruck one, he will immediately make to the bottom, and ſtay there ſome time; if he ſtays too long, give him a gentle touch, and he will immediately riſe, and give two or three ſtrong tugs; but when you have once turned him, he will ſoon yield.

The beſt method of angling for him is this: ſeek a ſhallow ſandy bottom, that leads into a deep hole; then throw into the ſhallow part of the ſtream four or five handfuls of marſh-worms, cut in pieces, which will ſoon drive down into the hole. Uſe a long rod of proper ſtrength, with a line proportionable; a ſmall hook, and no float. The hook muſt be tied to India graſs, on which put a cut ſhot ſix inches from the hook, and next to that a ſmall bullet. The uſe of the ſhot is to keep the bullet from ſlipping lower. This done, bait your hook with a ſhort well-ſcoured marſh-worm, throw in the ſhallow, and the ſtream will drive it into the hole. By this method you may catch more in two hours, than you can well carry away.

Another method often attended with ſucceſs, is this: ſeek a deep hole near the bank, plumb the depth over night, and bait it at the ſame time with grains well ſqueezed, and mixed with blood. In the morning early viſit the place again, and take your ſtand out of ſight; bait your hook with a large red-worm, and drop it gently into the hole. With theſe precautions you will find ſport. But remember always when you have occaſion to plumb the depth of a place the night before, to take notice, at your return, whether the water be riſen or fallen, and make an allowance accordingly. You may have very good ſport, if you bait with chewed white bread, and angle with gentles, or the brood of waſps, but then you are not to uſe ſo long or ſtrong a rod or line, and a ſmaller hook.

Natural History of the RUD.

THIS is broader than a roach, and thicker than a bream. The back is of an olive-colour; and the ſides and belly of a gold colour, marked with red. The ventral and anal fins, and the tail, are generally of a deep red. The tail is alſo a little forked. The head is ſmall, and the iris yellow, inclining to red. The ſcales are very large. This fiſh is in great eſteem, and always in ſeaſon, except in April, which is the time of ſpawning. It is found in the Rhine, in Germany; in the Charwell, near Oxford; and in the Witham, in Lincolnſhire.

Natural History of the ROACH.

THE body of the Roach is pretty deep, but thin. The back, which is pretty ſharply ridged, is of a duſky colour, and ſometimes bluiſh: the belly is pale: the iris of the eyes, the fins and tail, are red. The tail is alſo forked. It is of a gold colour about the gills, and the mouth is round and deſtitute of teeth; it being a leather-mouthed fiſh. It breeds both in ponds and rivers, but thoſe bred in the latter are the beſt, though the others are the longeſt. This fiſh and the dace are coarſe and inſipid meat.

Angle, as for dare or dace, with one gentle. They ſpawn about the middle of May, and recover their ſtrength in a month's time.

When you angle for roach in a pond, throw in a little chewed white bread, and let your bait (which ought to be one large gentle) lie within ſix inches of the bottom, and you will not only take much larger, but more in number than you will by any other method. In winter you may fiſh for him with paſte or gentles; in April with worms or cod-bait; but in very hot weather with very little white ſnails, earth-bobs, new cheeſe, or with flies under water, for he ſeldom takes them at the top, as the dace will; and this is the principal thing wherein they differ.

In Auguſt the Roach-fiſhery affords great diverſion about London, where it is thus practiſed: any waterman will provide a boat, with rip-hooks, to fix it in the middle of the ſtream; and prepare your ground-bait, which is of bran and ſtale bread, mixed in balls, and thrown in, up the ſtream, with clay or ſmall ſtones within, ſufficient to ſink it ſpeedily, and lodge it at the bottom. Not more than three can conveniently fiſh in one boat. Your tackle muſt be ſtrong, your float large, and heavy leaded, to ſink the quicker. The conſtant bait is a well-ſcoured gentle, three at leaſt on your hook, which muſt ſwim ten or twelve inches, at moſt, from the bottom. The beſt times are, from half-ebb tide, to within two hours of high-water: and the beſt places are, the whole ſand-bank in the middle, facing the Tower; that oppoſite the Temple; before Whitehall; and againſt Chelſea-church. At theſe places you will find plenty of ſport. Some, with very good ſucceſs, pick out ſome ſtand upon the ſhore, among the chalk-ſtones, at the banks of the Iſle of Dogs, near Limehouſe, under the wind-mills, and fiſh there in the ſame manner, from dead-ebb, till within an hour or more of high-water, retiring backwards as the flood comes in.

There is alſo another highly-approved method of this diverſion below-bridge, called ſtern-fiſhing, by faſtening a boat at the ſtern of any collier or veſſel that has lately been a voyage, and has her bottom foul, which contains inſects and food for the fiſh; uſe about two joints of your rod at moſt, and a line not longer than four feet, your float fixed within twelve inches of the top of it. Angle there with three or four gentles on your hook at a time, and lay in as cloſe to the ſhip's ſtern as you can, letting it ſwim about three yards. In this you uſe no ground-bait. You muſt begin when the tide firſt ebbs, and for two hours, at leaſt, you will not fail of catching many fiſh (roach and dace) and thoſe very large ones.

In Thames angling, you muſt not attempt when there is a cold and raw air, high wind, rough water, or wet weather, or when there are ſpring-tides, or the land-floods come down. At the chalk-hill, and about the piles of London-bridge, there is excellent ſport when the tide is low. Be always careful to pitch your boat on that ſide the river that is moſt under the wind.

Natural History of the DACE, or DARE.

THE Dace haunts the ſame places as the roach, and is a great breeder. It is a very lively fiſh, and in ſummer delights in frolicking near the ſurface of the water. The back is varied with duſky and blue; the ſides and belly are ſilvery, and the tail is much forked. It reſembles a chub, though it is ſmaller and ſomewhat whiter. The iris of the eye is yellow.

The fleſh of the Dace is ſweet, ſoft, and of good nouriſhment, but is in no great eſteem. They ſpawn in February and March, and are fit to eat in April and May; but their higheſt ſeaſon is from September to the latter end of February. They delight in gravelly and ſandy bottoms, and the deepeſt part of the river under the ſhade of trees, or dock-leaves.

It is a very ſimple fiſh, and will often bite when you leaſt expect it. However, their darling bait is a gentle at the bottom, and a ſmall fly at the top. In the ſummer months an ant-fly is beſt. They will likewiſe take any paſte, as well as all ſorts of ſmall worms.

Angle for him with a very ſlender rod, a line of ſingle hairs from the top to the hook, which is to be a very ſmall one; one ſmall ſhot, a float made of two ſea-gull quills, cut within about half an inch of the feather, and thruſt one of the open ends into the other, and then whipt faſt with fine waxed ſilk. This makes the very beſt float, and is drawn under the water without danger of pricking the fiſh. When you are ſo provided, get ſome white bread, and chew it, and throw it into the water in ſmall pieces, and bait with gentles, you will have good ſport: or you may fiſh with boiled malt, and bait with grains, and you will frequently catch chub, bream, and many other ſorts of fiſh. He will likewiſe take all ſorts of flies very well. If you point your hook with one gentle in the ſpring, he takes an earth-bob very well.

If you angle where two mill-ſtreams are going at one and the ſame time, let it be in the eddy between the two ſtreams: firſt make uſe of your plummet; and if the water be deep, you muſt angle within a foot of the bottom, and perhaps you will find but little ſport. But if it proves to be ſhallow, that is, about the depth of two feet, or not exceeding three, then bait your hook with three large gentles: uſe a cork float, which ought not to be a foot and a half from the hook, and have a quick eye to ſtrike at the very firſt bite; for if there be any large Dace in the mill-pool, they will reſort to the eddy between the two ſtreams.

Natural History of the CHUB.

THIS is a very coarſe fiſh, and full of bones: it has a large blackiſh head, and its body is longer than that of the carp. The back is of a dark green, and the belly and ſides of a ſilver colour: the temples are yellowiſh, and the ſcales, like thoſe of the carp, are large and angular. The iris of the eyes is of gold and ſilver colours. The tail is forked, and the fins are of a blackiſh blue; though ſometimes they are tinctured with red. The belly is broadiſh, and the lateral lines run parallel to the bottom of the belly. The Chub is a very timid fiſh, ſinking to the bottom on the leaſt alarm. It does not grow to a very large ſize; though they have been known to weigh upwards of five pounds.

In Auguſt, and in the cooler months, a yellow paſte, made of the ſtrongeſt cheeſe, and pounded in a mortar with a little butter, and ſo much ſaffron, as being beaten ſmall, will turn it to a lemon colour, is a very good bait. In the winter months, the Chub is eſteemed the beſt, it being obſerved, that the forked bones are then loſt, or turned into a kind of griſtle, eſpecially if the fiſh is baked. Some make a paſte for this ſeaſon of cheeſe and turpentine. He will alſo bite at a minnow, as well as the trout. But take this for a rule in chub-fiſhing, that in hot weather he is to be angled for towards the mid-water, or near the top; and in colder weather near the bottom. And if you fiſh for him near the top, with a beetle or fly, be careful to let your line be very long, and to keep out of ſight. The ſpawn of this fiſh is excellent meat; and the head of a large chevin, the throat being well waſhed, is the beſt part of him. The fleſh is white, ſoft, and inſipid, and is but in very little eſteem among the generality of people. The Chub is very fond of a large bait. In the ſummer, at mid-water, five or ſix cabbage, nettle, or cattle dock-grubs, or a mixture of all or any of the above, mixed with flies, are very good baits.

The Chub uſually ſwims in mid-water, and ſometimes at the top, and therefore is beſt taken by dibbing. From the beginning of May to September, you may angle for him before the ſun riſes till nine, and in June, July, and Auguſt, from five till dark, and with the white moth all the night over; but in the winter he lies lower, and then you may fiſh for him at the bottom in the middle of the day, with new cow-brains. Some people will chew and ſpit them into the hole where they fiſh; but if you can mix them very ſmall in a cup with a little water, and throw a ſmall quantity in at a time, you will have ſport, if you bait with the ſame; this, and the ſpinal marrow of an ox, is the very beſt winter bait. They will take almoſt any bait, as the brains of oxen or ſheep dried, and cut into ſmall pieces; all ſorts of worms, gentles, the brood of waſps, blackberries, dewberries, new cheeſe, graſshoppers, black ſnails with their bellies ſlit, and all ſorts of paſte.

In dibbing, the Chub will take a black ant-fly, ſmall butterflies with the great wings cut off, oak-worms, aſh-flies, green caterpillars, and the cod-bait; in ſhort, there is ſcarce any thing comes amiſs to him. It is but a cowardly fiſh, and when once turned, yields preſently. But you muſt maſter it as ſoon as you can, becauſe when he is hooked, he does not make to the middle of the ſtream, but to the banks, which may endanger your tackle. When you throw your bait into the water, they fly from it, but return immediately to ſee what it is, and, if they like it, they ſwallow it without heſitation, if you keep yourſelf out of ſight.

This fiſh will afford good ſport, if you do as follows. Go to one of their holes, where, in moſt hot days, you may find a number of them floating near the top of the water. Get two or three graſshoppers as you go over the meadows, and place yourſelf ſecretly behind a tree, remaining as free from motion as poſſible. Put a graſshopper upon your hook, and let your hook hang a quarter of a yard ſhort of the water; to which end you muſt reſt your rod on ſome bough of a tree. It is probable the Chub will ſink down towards the bottom of the water at the firſt ſhadow of your rod, they being the moſt fearful of fiſhes, and apt to do thus if but a bird flies over them, and makes the leaſt ſhadow on the water: but they will preſently riſe up to the top again, and there lie floating till ſome ſhadow frights them afreſh: when they lie thus upon the top of the water, fix your eye upon the beſt Chub you can ſingle out, and move your rod gently towards him. Let your bait fall eaſily upon the water, three or four inches before him, and he will infallibly take it, and you will be as certain to catch him; for he is one of thoſe leather-mouthed fiſhes, of which a hook ſcarce ever loſes its hold: but be ſure to give him play enough, before you offer to take him out of the water. When a graſshopper cannot

cannot be found, a black ſnail, with his belly ſlit, to ſhew his white, or a piece of ſoft cheeſe, or any ſort of natural flies, will uſually do as well.

When you angle for him with a fly, let it be a very large hackle, and point your hook with four or five large gentles, or botts; caſt your line, which ought to be fourteen or fifteen yards long, acroſs the ſtream, and let the current carry it down, as they will take a fly much better a little under water than at top. When you ſee your line draw, ſtrike pretty ſmart. Your rod ſhould be ſix yards, and not too ſlender. A ſmall lamprey is no bad bait for a Chub.

NATURAL HISTORY of the BLEAK.

THE Bleak ſeldom exceeds ſix inches in length: the body is broadiſh, and not unlike that of a ſprat; the head ſmall; the ſcales are thin, and of a ſilver colour, and come off eaſily. The back is of a bluiſh or greeniſh brown, and the eyes are large, marked on the lower ſide with a blood-coloured ſpot. The ſkull is tranſparent, and the fleſh is ſweet, delicate, and nouriſhing. Artificial pearls are made with the ſcales of the Bleak. They are beat into a fine powder, then diluted with water, and introduced into a thin glaſs bubble, which is afterwards filled with wax. This art was invented by the French, and one artiſt in Paris has been known to uſe thirty hampers full of fiſh in his manufacture in one year. At certain ſeaſons of the year, theſe fiſh ſeem to be affected with the vertigo: they are ſeen tumbling about near the ſurface of the water, and are then called mad Bleaks by the Thames fiſhermen.

The Bleak ſpawns in March, and recovers its ſtrength in three weeks. The fleſh is ſweet, nouriſhing, and pleaſant, but little ſought after on account of the diminutive ſize of the fiſh.

The beſt baits for him in the cold months, are gentles and ſmall red-worms, and in ſummer you may catch great numbers with an artificial ant-fly, or a very ſmall gnat. There cannot be better ſport than whipping for Bleaks, in a boat, or on a bank, in the ſwift water, in a ſummer's evening, with a hazle-top, about five or ſix feet long, and a line twice the length of the rod. Point your hook with a ſmall gentle. As this fiſh is always changing its ſituation, and ſeems to be ever reſtleſs, and ever in motion, the beſt method of angling for him is with a pater-noſter line; that is, a line with half a dozen or more hooks, tied to the main line, about three or four inches above one another. He will take your bait wherever he meets it.

NATURAL HISTORY of the WHITE BAIT.

VARIOUS are the conjectures about this ſpecies; the general opinion however is, that they are the fry of ſome fiſh. Some attribute it to the bleak, others to the ſhad, the ſprat, and the ſmelt. It bears a greater ſimilarity to the bleak than to any other, but it is impoſſible for us to claſs it with any degree of certainty. In the months of July and Auguſt, innumerable multitudes of theſe fiſh are taken in the Thames, near Blackwall and Greenwich. They are eſteemed very delicious when fried with flour, and the taverns contiguous to thoſe places are much reſorted to, when the White Bait are in ſeaſon, by the lower order of epicures. The head, back, and ſides of this fiſh are ſilvery, and the back tinged with green. Its uſual length is about two inches. It is remarkable, that theſe fiſh expire the very inſtant they are taken out of the water. A wager was laid in the ſummer of 1775, that a perſon could not ſhew a live White Bait above London-bridge. The experiment was tried, a well-boat was procured, and ſome hundreds of theſe little fiſh poured into it the inſtant they were taken out of the Thames; the utmoſt expedition was then uſed to get to the weſt ſide of London-bridge; after which the fiſh were immediately inſpected, and not one of them remained alive.

NATURAL HISTORY of the MINNOW.

THE Minnow is much ſmaller than the gudgeon, having a roundiſh body, and ſeldom exceeds three inches in length. Its body is ſmooth, and the ſcales are ſo ſmall as to be hardly viſible. The back is flat, and of a deep olive colour: the belly and ſides are mottled with ſcarlet in ſome, in others white, and in others with a ſhining blue. The tail is forked, and marked near the baſe with a duſky ſpot. Theſe beautiful fiſh appear in ſhoals in many of our ſmall gravelly ſtreams.

NATURAL HISTORY of the GOLD FISH.

THE Gold Fiſh was firſt introduced into this country about the year 1691, but were not generally known till 1728, when many of them were brought to England. In China Gold Fiſh are kept for amuſement by every perſon of faſhion, either in porcelain or glaſs veſſels, or in the ſmall baſons that decorate the courts of the Chineſe houſes. The form of the Gold Fiſh reſembles that of the carp; they have been ſeen in England of the length of eight inches, and Du Halde informs us, they grow to the ſize of our largeſt herring in their native country. In the colours of this fiſh there is infinite variety: ſome are marked with a fine blue, a brown, and a bright ſilver; but the general and predominant colour is gold of a moſt amazing ſplendour. This ſpecies is particularly diſtinguiſhed by the anal fins, which are placed oppoſite each other like the ventral fins; and not behind each other, like thoſe of other fiſh.

Of the DIVISION of SHELL-FISH.

THESE are uſually divided, by naturaliſts, into cruſtaceous and teſtaceous animals. Cruſtaceous fiſh, ſuch as the crab and the lobſter, are furniſhed with a ſhell that is not of a ſtony hardneſs, but is in ſome meaſure capable of yielding. Teſtaceous fiſhes, like the oyſter or cockle, are furniſhed with a ſhell of a ſtony hardneſs; which is brittle, and incapable of yielding. The lobſter, the crab, and the tortoiſe, are of the cruſtaceous kinds: the numerous tribe of oyſters, muſcles, cockles, and ſea-ſnails, which offer infinite variety, are of the teſtaceous kinds.

NATURAL HISTORY of the LOBSTER.

THE Lobſter and the crab, however different in figure, are nearly the ſame in manners and conformation. Though without any warmth in their bodies, or even without red blood circulating through their veins, they are animals wonderfully voracious: they ſeize upon every thing that has life, and whatever they attack is ſure to periſh, tho' never ſo well defended. Theſe voracious animals even devour each other; and they may, in ſome meaſure, be ſaid to eat themſelves; as they annually change their ſhell and ſtomach, and their old ſtomach is uſually the firſt repaſt for the new one.

CRUSTACEOUS ANIMALS

Squilla mantis Indica

Cancer volans

Squilla lata

Cancellus anatum longimanus

Squilla Arenaria

Cancer Ianosus

Cancer spinosus longimanus minor.

Squilla lutaria

Paguris

Cancer raniformis

Cancer lunaris

Cancer Spinosus

Cancer spinosus Lonaimanus major

Cancer floridus

Pediculus Marinus, or The Sea Louse.

Cancer Spinosus, or the Rots-Grab

Cancellus anatum cræsus

Cancer Arachnoides or The Spider Grab.

Cancellus anatum vulgaris

Cancellus Anatum rotundus

Cancer Calappoides

Cancer Moluccensis or The King-Grab.

Carey sculp.

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The form of the Lobſter is ſo very extraordinary, that the head may be almoſt miſtaken for the tail; but it may be ſoon diſcovered, that the animal moves with its claws foremoſt; and that the part which plays within itſelf by joints, like a coat of armour, is the tail. The two great claws, which are the Lobſter's inſtruments of proviſion and defence, open like a pair of nippers, and have very great power; they are uſually notched like a ſaw, which enables it to take the firmer hold. Beſides theſe inſtruments, the animal has eight legs, four on each ſide; which, with the aſſiſtance of the tail, give the animal its progreſſive and ſideling motion. The head, which is very ſmall, is between the two claws, and is furniſhed with eyes, which appear like two black horny ſpecks on each ſide. The mouth, like that of inſects, opens the long way of the body; and is furniſhed with two teeth for the comminution of its food: between the two teeth there is a fleſhy ſubſtance in the ſhape of a tongue. It has alſo three teeth in the ſtomach; one on each ſide, and the other below. It has two long feelers, or horns, that iſſue on each ſide of the head. The tail is the grand inſtrument of motion; and with this it can raiſe itſelf in the water. Under this the ſpawn is lodged in great abundance; every pea adhering to the next by a very fine filament, which is almoſt imperceptible. They continue in this ſituation till they become furniſhed with limbs and motion, and then drop off into the water.

After leaving the parent, the young lobſters immediately ſeek for refuge in the ſmalleſt clefts of rocks, or other crevices at the bottom of the ſea, where the opening is but ſmall, and ſuch opening can be eaſily defended. There they grow larger in a very ſhort time, from the mere accidental nouriſhment which the water waſhes to their retreats. In a few weeks they acquire a hard firm ſhell, which furniſhes them with offenſive and defenſive armour.

The body of the Lobſter continues to increaſe, while the ſhell continues of the ſame ſize; the animal thus becomes too large for its habitation, and is impriſoned within the cruſt that nature has gathered round it; and is therefore under a neceſſity of getting free. As the young of this kind grow faſter, they change their ſhell oftener than the old; the latter remaining in the ſame ſhell for two or three years together. In general, however, they change their ſhell once a year; but for ſome days before it undergoes this change, it ceaſes to be ſo voracious as formerly, and lies torpid and motionleſs, as if in anxious expectation of the approaching alteration. Juſt before caſting its ſhell, it throws itſelf upon its back, and the whole body is in violent motion, and at length the ſhell is ſeen beginning to divide at its junctures. It alſo appears turned inſide out, and its ſtomach comes away with its ſhell. In a ſhort time, however, this wonderful creature finds itſelf at liberty; but in ſo weak and enfeebled a ſtate, that it continues motionleſs for ſeveral hours. After this extraordinary change, it has the ſoftneſs and the timidity of a worm; every animal of the deep being then a powerful enemy, which they can neither eſcape or oppoſe. But this ſtate of defenceleſs imbecility is of ſhort duration, for in leſs than two days, the ſkin of its body is almoſt as hard as before; its appetite alſo increaſes; and, however extraordinary it may appear, its firſt repaſt is upon its own ſtomach, and afterwards it devours its former ſhell. In about forty-eight hours, the new ſhell is perfectly formed, and becomes as hard as that which it has parted with.

Thus newly equipped, the creature ventures more boldly among the animals at bottom, and, in its combats, frequently ſuffers ſome mutilation. A joint or a claw is ſometimes loſt in theſe encounters, which nature quickly repairs; a new claw ſpeedily ſprings out, which, at firſt, is ſmall and tender, but in the ſpace of three weeks becomes *almoſt* as large as the old one which is loſt; but it never arrives to the full ſize: we often ſee the claws of Lobſters of unequal magnitude, which is thus accounted for.

There are many variations of this extraordinary animal. It is found above three feet in length, and if we admit the ſhrimp and the prawn in the claſs, it is ſometimes ſeen not above an inch. Theſe all live in the water, and cannot long endure its abſence. The ſhell, when taken out of the water, is black, but becomes red by boiling.

The river craw-fiſh differs little from the Lobſter; but it will live only in the freſh water, and the other only in the ſea.

Natural History of the CRAB.

THE Crab reſembles the lobſter in its habits and conformation, but differs materially in ſhape. It is found equally in freſh and ſalt water, as well upon land as in the ocean. The tail is not ſo apparent as in the former; being that broad flap that appears to cover a part of the belly, and, when lifted, diſcovers the ſpawn ſituated there in great abundance. Like the lobſter, it has two claws; and, like the lobſter, it has eight legs, four on each ſide. Like the lobſter, it is alſo a bold voracious animal; and indeed it reſembles that animal in every thing but the amazing bulk of its body, compared to the ſize of its head, and the length of its inteſtines, which have many convolutions.

The VIOLET CRAB.

The Violet Crab of the Caribbe Iſlands is truly remarkable for its ſhape, the delicacy of its fleſh, and the ſingularity of its manners. It reſembles two hands cut through the middle, and joined together; for each ſide looks like four fingers, and the two nippers or claws reſemble the thumbs. The reſt of the body is covered with a ſhell, as large as a man's hand, and bunched in the middle; on the fore part of which there are two long tranſparent eyes, about the ſize of a grain of barley, and as hard as horn. The mouth is covered with a kind of barbs; under which there are two broad ſharp teeth as white as ſnow. With theſe the animal can eaſily cut fruits, leaves, and rotten wood, which is their uſual food.

The ſhell is full of a thick, fat, fibrous liquor, which is uſed by the inhabitants in ſauces. In the middle of this is the ſtomach; and under the body there is a kind of breaſt-plate, compoſed of ſeveral pieces ſet together; and beneath that, on each ſide, there are five or ſix barbs.

Theſe animals are, in general, of a violet colour, though ſome are variegated with white, blue, and violet: but the ſurprizing part of this creature's hiſtory is to follow; and what we are going to relate, were it not as confidently confirmed as any other circumſtance in natural hiſtory, might well ſtagger our belief. They not only live in a kind of orderly ſociety in their retreats in the mountains, but in the months of April or May, they march down to the ſea-ſide in a body of ſome millions at a time: they ſally out by thouſands from the ſtumps of hollow trees, from the clefts of rocks, and from the holes which they dig for themſelves under the ſurface of the earth. The ground is then covered with this band of adventurers, inſomuch that it is almoſt impoſſible to ſet down one's foot without treading upon them. The proceſſion ſets forward from the mountains with as much regularity, as an army under the guidance of an experienced general; and are uſually divided into three battalions, or companies;

nies; the first of which consists of the largest and strongest males, that, like pioneers, march forward to clear the route, and face the greatest dangers. These are often obliged to halt for want of rain, and go into the most convenient encampment till the weather changes, for they cannot long endure the intense heat of the sun. The main body of the army is composed of females, which never leave the mountains till the rain is set in for some time, and then they descend in regular battalia, being formed into columns of fifty paces in breadth, and three miles in length, and so close, that they almost cover the ground. Three or four days after this the rear guard follows; a straggling undisciplined tribe, consisting of both males and females. They march chiefly in the night, but if it rains in the day, they do not fail to profit by the occasion; and they continue to move forward in their slow uniform manner. When the sun shines, they get to the sides of woods to avoid the heat, waiting till the cool of the evening. When they are terrified, they march back in a confused disorderly manner, holding up their nippers, with which they sometimes tear off a piece of the skin, and then leave the weapon where they inflicted the wound: they even try to intimidate their enemies, by clattering their nippers together. They are however possessed of one very unsocial property, for if any one of them becomes accidentally maimed, so as to be incapable of proceeding, the rest fall upon him, and devour him on the spot.

In dry seasons, they are sometimes three months in marching down to the sea-side; but, in heavy rains, they often reach it in eight or ten days.

When they have arrived at their destined port, they prepare to cast their spawn. The Crab has no sooner reached the shore, than it hastens eagerly to the edge of the water, and suffers the waves that beat upon the shore to flow over its body two or three times. This seems only a preparation for bringing their spawn to maturity; for, without farther delay, they withdraw to seek a lodging upon land. In the mean time the spawn grows larger, is excluded out of the body, and adheres to the barbs under the breast-plate. This bunch is seen as large as a hen's egg, and exactly resembling the roes of herrings. In this state of pregnancy, they again seek the shore for the last time, and shaking off their spawn into the water, leave chance to bring it to maturity. Immense shoals of hungry fish are at the shore, in expectation of this annual supply; and about two-thirds of the Crabbs eggs are immediately devoured by these rapacious invaders. The eggs which escape are hatched under the sand; and soon after millions at a time of these little Crabs are seen quitting the shore, and slowly travelling up the mountains.

The old ones, however, are not so active to return; they become so lean and feeble that they can hardly creep along, and the flesh at that time changes its colour; therefore most of them are obliged to stay in the flat parts till they recover, making holes in the earth, which they cover at the mouth with leaves and dirt, so that no air may enter. There they throw off their old shells, which they leave in a manner quite whole; the place where they opened on the belly being unseen. After this they are quite naked, and almost without motion, for five or six days together, when they become so fat as to be delicious food. They have then four large white stones under their stomachs, which gradually decrease in proportion as the shell hardens, and, when they come to perfection, entirely disappear. At that time the animal is seen slowly making its way back to its retreats in the mountains.

The SOLDIER CRAB.

The Soldier Crab has some similitude to the lobster, if divested of its shell. It is usually about four inches long, has no shell behind, but is covered down to the tail with a rough skin, terminating in a point. Like the lobster, however, it is armed with strong hard nippers before; one of which is as thick as a man's thumb, and pinches most powerfully. But though nature has refused a shell to any part of this animal except its nippers, the Soldier Crab has recourse to art for a supply: it takes possession of the deserted shell of some other animal, in which it resides, till by growing too large for its habitation, it is under a necessity of change. They descend every year to the sea-side to deposit their spawn and provide themselves with a new shell; and when they find one proportionable to their bulk, they get into it, and march along as if they were cloathed in armour; from whence they have the name of Soldiers. They march up to the tops of mountains, and take their lodgings in hollow trees, where they live upon leaves, fruits, and rotten wood. The next year, when the body begins to grow too large for the shell, they travel down to the sea-side again, in search of others that fit them better. After examining several, and finding out one of a proper size, they immediately quit their old habitation, and occupy the new one.

Besides these, there are the white Crab of the Caribbe Islands; the sea Crab; the square Crab; the South-American Crab; the Indian Land Crab, &c. but they have all one property, which is very wonderful. When their nippers are laid hold of, they can easily part with them to make their escape; besides, if one of them should happen to be wounded, the animal immediately parts with it, and by that means gets rid of the wound and the limb together; well knowing that nature will soon furnish it with another.

NATURAL HISTORY of the TORTOISE.

TORTOISES are usually divided into those that live upon land, and those that subsist in the water; and use has made a distinction even in the name; the one being called Tortoises, the other turtles. Seba has proved, however, that all Tortoises are amphibious; that the land Tortoise will live in the water, and that the sea turtle can be fed upon land. The land Tortoise is generally found from one foot to five feet long, from the end of the snout to the end of the tail; and from five to eighteen inches across the back. It has a small head, somewhat resembling that of a serpent; an eye without the upper-lid; the under eye-lid serving to cover and keep that organ in safety. It has a long scaly tail, like that of the lizard. It can put out or conceal its head at pleasure, under the great pent-house of its shell; where it can remain secure from all attacks.

Though peaceable in itself, the Tortoise is admirably formed for war, and seems almost endued with immortality. Nothing can kill it; the depriving it of part of its body, is but a slight injury; it will live, though deprived of the brain; it will live though deprived of the head. Redi informs us, that he made a large opening in the head of a land Tortoise, drew out all the brain, and washed the cavity so as not to leave the smallest part remaining, and then, leaving the hole open, set the animal at liberty. Notwithstanding this, the Tortoise marched away without seeming to have received the smallest injury; and lived without a brain for six months. The Italian philosopher carried his

experiment

experiment ſtill farther; for he cut off the head, and the animal lived twenty-three days after its ſeparation from the body.

Tortoiſes are alſo remarkable for their longevity: they are commonly known to live upwards of eighty years. There was one kept in the garden belonging to Lambeth Palace, that was remembered above an hundred and twenty.

This animal retires to ſome cavern to ſleep for the winter; and, at that time, when its food is no longer in plenty, it happily becomes inſenſible to the want: it is ſometimes buried two or three feet in the ground, having firſt providently furniſhed its hole with moſs, graſs, and other ſubſtances; as well to keep the retreat warm, as to ſerve for food, in caſe it ſhould prematurely wake from its ſtate of ſtupefaction. From this dormant ſtate the Tortoiſe is awakened by the genial return of ſpring.

Theſe animals are frequently taken into gardens, as they are thought to deſtroy inſects and ſnails in great abundance. The ſtrength of the Tortoiſe is very great; children have been ſeen to get upon the back of it, and it has not appeared to be overloaded, but moved off with its burthen to where it expected to be fed; but would carry them no farther.

In their external form, all Tortoiſes nearly reſemble each other; their outward covering being compoſed of two great ſhells; one of which is laid upon the other, and they touch only at the edges: but upon a cloſer inſpection, we ſhall find that the upper ſhell is compoſed of no leſs than thirteen pieces, which are laid flat upon the ribs, like the tiles of an houſe; by which the ſhell is kept arched and ſupported. Indeed, to an inattentive obſerver, the ſhells, both above and below, ſeem to make each but one piece; but they are bound together at the edges by very ſtrong and hard ligaments.

Natural History of the SEA TORTOISE, or TURTLE.

TURTLES are uſually diſtinguiſhed by ſailors into four kinds: the trunk Turtle, the logger-head, the hawkſbill, and the green Turtle.

The trunk Turtle is generally larger than the reſt, and its back is higher and rounder. The fleſh of this Turtle is rank and unwholſome.

The logger-head has obtained his title from the ſize of his head, which is much larger in proportion than that of the other kinds. The fleſh of this alſo is rank, and very ſeldom eaten.

The hawkſbill Turtle has a long and ſmall mouth, ſomewhat reſembling the bill of an hawk. Though the fleſh of this Turtle is very indifferent, the ſhell ſerves for the moſt valuable purpoſes. This is the animal which ſupplies the Tortoiſe-ſhell, of which ſnuff-boxes and a variety of beautiful trinkets are made. The fleſh of this alſo is very indifferent eating.

The green Turtle is the moſt celebrated, and the moſt valuable of all the animals of the Tortoiſe kind. The delicacy of its fleſh, and its nutritive qualities, together with the property of being eaſily digeſted, are now well known among us. Dampier appears to be the firſt who informed us of the diſtinctions among theſe animals; and that, while the reſt might be valuable for other purpoſes, the green Turtle alone was chiefly prized for the delicacy of its fleſh. The green Turtle is indeed become a branch of commerce, and ſhips are provided with conveniences for ſupplying them with water and proviſion, to bring them over in health from Jamaica, and other Weſt-India Iſlands. This cannot, however, be always effected; for though they ſcarce require any proviſion upon the voyage, yet the working of the ſhip occaſions them to be beat againſt the ſides of the boat which contains them, by which they become very lean and battered; ſo that, in order to eat this animal in the higheſt perfection, inſtead of bringing the Turtle to the epicure, the epicure ought to be tranſported to the Turtle.

The colour of the ſhell of this animal is rather greener than that of others of this kind; whence it has the name of the green Turtle. Thoſe which are about two hundred weight are the moſt common ſize, though they are ſometimes found to exceed five hundred. During the ſeaſon, the citizens of London are remarkable for regaling themſelves upon Turtle, and great numbers of theſe animals are dreſſed at the Queen's-arms-tavern, in St. Paul's church-yard, where we remember to have ſeen them in the two extremes: Mr. Bates exhibited at one time three Turtles, two of which together did not weigh three ounces, and the other exceeded nine hundred pounds in weight. The ancients, however, ſpeak of much larger Turtles: Ælian aſſures us, that the houſes in the iſland of Taprobane, are uſually covered with a ſingle ſhell; and Diodorus Siculus tells us, that a people neighbouring on Ethiopia, called the Turtle-eaters, coaſted along the ſhore in boats made of the upper ſhell of this animal.

The Turtle ſeldom comes from the ſea, but to depoſit its eggs, and ſometimes to ſport in freſh water. In about twenty-five days after laying, the eggs are hatched by the heat of the ſun; and the young Turtles, about the ſize of quails, are ſeen burſting from the ſand, as if earth-born, and running directly to the ſea, with inſtinct only for their guide. But it ſometimes happens that the ſurges of the ſea beat them back upon the ſhore, and they become a prey to the innumerable quantities of birds, which at that time haunt the coaſts.

Natural History of SEA SNAILS.

THOUGH the land and Sea Snails reſemble each other in many particulars, many of the latter are totally deſtitute of horns, and none of them have more than two. Indeed, if the horns of Snails are furniſhed with eyes, and if, as ſome imagine, the length of the horn, like the tube of a teleſcope, aſſiſt viſion, theſe animals that reſide in the gloomy bottom of the deep, can have no great occaſion for them.

On viewing the ſhells of Sea-ſnails, we are convinced, that the animal which produces them is larger than thoſe of the ſame denomination upon land. The ſea appears to have the property of enlarging the magnitude of all its inhabitants. There is alſo a difference in the poſition of the mouth of the garden and Sea-ſnail. In the former, the mouth is placed croſs-wiſe, as in quadrupeds; furniſhed with jaw-bones, lips, and teeth. In moſt of the Sea Snails, the mouth is placed longitudinally in the head; and, in ſome, obliquely, or on one ſide. Others of the trochus kind, are without a mouth, but are furniſhed with a trunk, which is very long in ſome kinds, and ſhorter in others. Thoſe which are provided with this trunk, are, among Snails, what the tiger, the eagle, or the ſhark, are among beaſts, birds, or fiſhes: the whole race of ſhelled animals avoid their approach; and their ſtrongeſt built habitations yield to the ſuperior force of theſe invaders. Though their own ſhells are thick and clumſy, yet their motion at the bottom is ſwifter than that of moſt other ſhell fiſh, and they ſeize their prey with greater facility. They boldly venture to attack even the largeſt ſhells, and with their piercing trunk bore it through in a very ſhort time, and deſtroy its inhabitant.

But, of all Sea Snails, that which is moſt frequently ſeen ſwimming on the ſurface, is the nautilus; of which there are ſeveral ſpecies, which may be all divided into two. The one inhabits a ſmall white ſhell as thin as paper, which it is often ſeen to quit and reſume again; the other has a thicker ſhell, of the colour of mother of pearl, and but ſeldom quits it. This ſhell externally reſembles that of a large ſnail; but is generally ſix or eight inches acroſs: within it is divided into forty partitions, that communicate with each other by doors, if they may be ſo called. But the peculiarity for which the nautilus has been the moſt diſtinguiſhed, is its ſpreading the thin oar, and catching the flying gale, to uſe the poet's deſcription of it. Theſe animals, eſpecially thoſe of the *light kind*, are chiefly found in the Mediterranean. In a calm ſea, they are obſerved floating on the ſurface; ſome ſpreading their little ſail; ſome rowing with their feet, as if they were engaged in buſineſs of the utmoſt conſequence; and others floating upon their mouths, like a ſhip with the keel upwards.

The nautilus has eight feet, which iſſue near the mouth, and may as properly be called barbs: theſe are connected to each other by a ſkin, reſembling that between the toes of the duck; but thinner and more tranſparent; ſix of theſe feet are ſhorter than the reſt, and are held up as ſails to catch the wind in ſailing: the two others, which are longer, are kept in the water, ſerving like paddles, to ſteer their courſe by. When the weather is calm, it is ſeen expanding only a part of its ſail, and rowing with the reſt.

Sea Snails of every ſpecies appear to be a much more active animated tribe, than from their figure we ſhould be induced to imagine. Though they ſeem, to an inattentive ſpectator, as mere inert maſſes of ſoft fleſh, rather *loaded* than *covered* with a ſhell; when more cloſely examined, they are found to be furniſhed with the organs of life and ſenſation in tolerable perfection; and are poſſeſſed of appetites more poignant than thoſe of animals that ſeem more perfect in their formation.

NATURAL HISTORY of FISHES of the OYSTER KIND.

THE Oyſter differs very little from the muſcle, except in the thickneſs of its ſhell, and its greater imbecility. It is formed with organs of life and reſpiration; with inteſtines which are very voluminous, and with a liver, lungs, and heart. Like the muſcle it is ſelf-impregnated; and the ſhell, which the animal ſoon acquires, ſerves it for its future habitation. Like the muſcle, it opens its ſhell to receive the influx of water; and like that animal, is ſtrongly attached to its ſhell both above and below.

In many particulars, however, the Oyſter differs from the muſcle. The ſhells are not equal like thoſe of the muſcle, the one being cupped, and the other flat: it always reſts upon the cupped ſhell; for it would loſe all its water if it lay upon the flat ſide. The ſhells of the Oyſter are alſo thicker than thoſe of the muſcle: they are indeed ſo ſtrongly lined and defended, that no animal will attempt to pierce them.

The muſcle is capable of erecting itſelf on an edge, and going forward with a ſlow laborious motion; but the Oyſter is utterly unable to change its ſituation. It is wholly paſſive, and endeavours by all its powers to remain fixed to one ſpot at the bottom. Rocks, ſtones, ſea-weeds, &c. ſecure it againſt the agitation of the waves. In the rivers of the tropical climates, Oyſters are frequently ſeen growing even amidſt the branches of the foreſt. Trees on the banks of the ſtream often bend their branches into the water, and particularly the mangrove, which delights in a moiſt ſituation: on theſe the Oyſters hang in cluſters; and in proportion as their weight ſinks the plant into the water (where it ſtill continues growing) the Oyſters increaſe in number, and hang upon the branches. Theſe animals will adhere to any thing; and are often found ſticking to each other. This is effected by means of a kind of glue, which, when it cements, the joining is as hard as the ſhell, and is as difficult to be broken. Sometimes, indeed, the Oyſter grows to the rocks, ſomewhat like the muſcle, by threads; but theſe only take root in the ſhell, and do not ſpring from the body of the fiſh itſelf, as in the muſcle.

Oyſters uſually caſt their ſpawn in May: in the ſpace of two or three days, the young are covered with a ſhell; and in three years the fiſh is large enough to be brought to market. As they continue in the places where they are depoſited, and as they ſeem to have no other food than the afflux of ſea-water; it is the cuſtom at Colcheſter, and other places, where the tide ſettles in marſhes on land, to pick up large quantities of young Oyſters along the ſhore, which hardly exceed the ſize of a ſix-pence. Theſe are placed in beds where the tide comes in, where they remain for the ſpace of two or three years; and are then of a proper ſize to be taken for ſale. Oyſters are ſaid to be better taſted for being thus ſheltered from the agitations of the deep: and the freſh water, which mixes with the ſalt in theſe repoſitories, is ſaid to increaſe their growth in fatneſs, and to improve their flavour.

But theſe Oyſters are much ſmaller than thoſe which are found ſticking to rocks at the bottom of the ſea, uſually called rock Oyſters: theſe are ſometimes found five or ſix inches in diameter, and are eſteemed excellent food; but even theſe are very diminutive, compared to the Oyſters of the Eaſt Indies, ſome of which are upwards of two feet over: thoſe found along the coaſt of Coromandel, are capable of furniſhing a plentiful meal to eight or ten people; but they are much inferior to ours, both in delicacy and flavour.

Other bivalved ſhell fiſh, ſuch as the cockle, the ſcallop, and the razor-ſhell, have very minute diſtinctions. The ſcallop is principally remarkable for its method of moving forward upon land, or ſwimming upon the ſurface of the water. When it is deſerted by the tide, it makes very extraordinary efforts to regain the water, moving towards the ſea in a moſt ſingular manner. When in the water, it is capable of raiſing itſelf to the ſurface, ſupporting itſelf there, and even of making its way with ſome degree of celerity.

The pivot, or razor-ſhell, which has the latter name from its reſembling the haft of a razor, has all its motions confined to ſinking or raiſing a foot downwards or upwards in the ſand; for it never quits the ſpot where it was firſt planted. It is frequently ſeen to riſe about half-way out of its hole, but as ſoon as it is diſturbed, it ſinks perpendicularly down again.

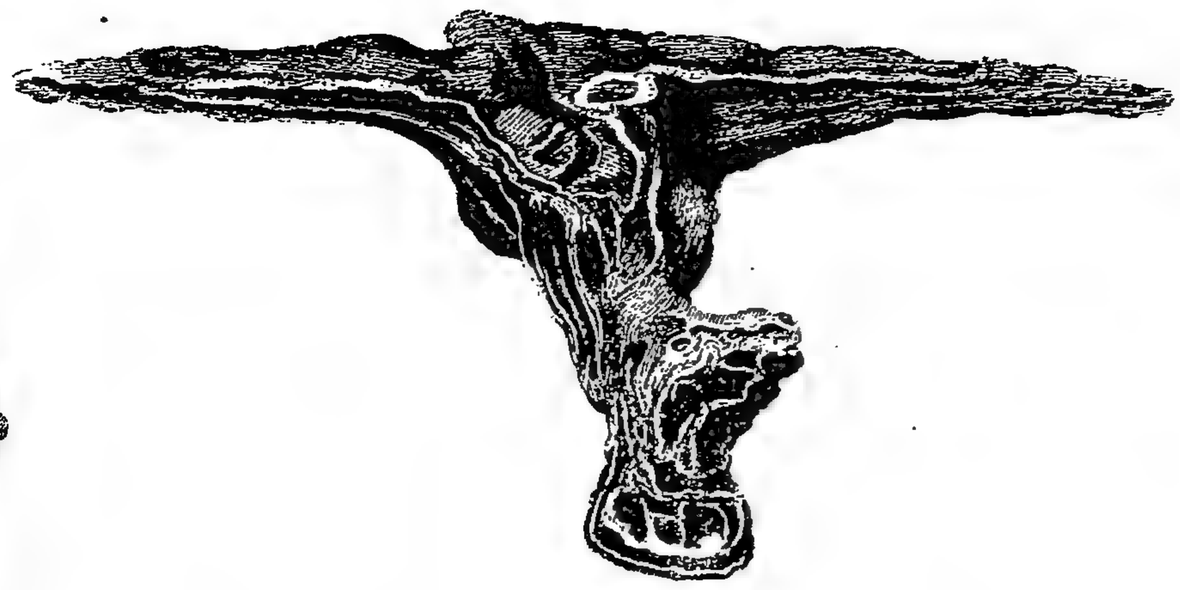
It is in this claſs of ſhell fiſh that pearls are found in greateſt abundance; and it is in the internal parts of theſe ſhells that are of a ſhining ſilvery colour, that theſe gems are uſually generated; but the pearl is alſo found in the muſcle or the ſcallop, as well as in the Oyſter: but that which particularly obtains the name of the pearl Oyſter, has a large ſtrong whitiſh ſhell, wrinkled and rough without, and within ſmooth, and of a ſilver colour. From theſe the mother-of-pearl is taken; which is nothing more than the internal coats of the ſhell, reſembling the pearl in colour and conſiſtence.

The roundeſt pearls, and thoſe of the beſt colour,

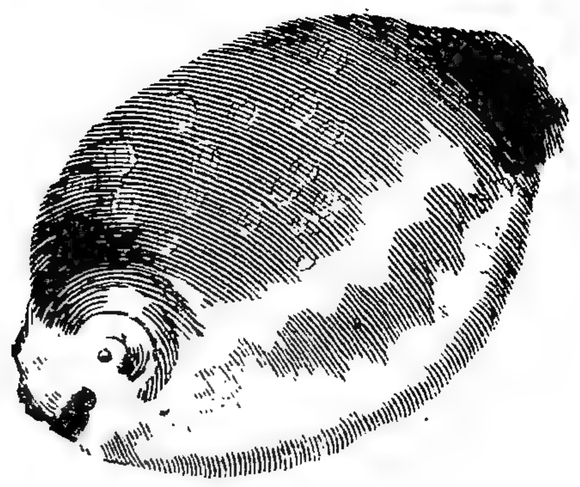
are

SHELL - FISH.

The Conic *prickly* Oister

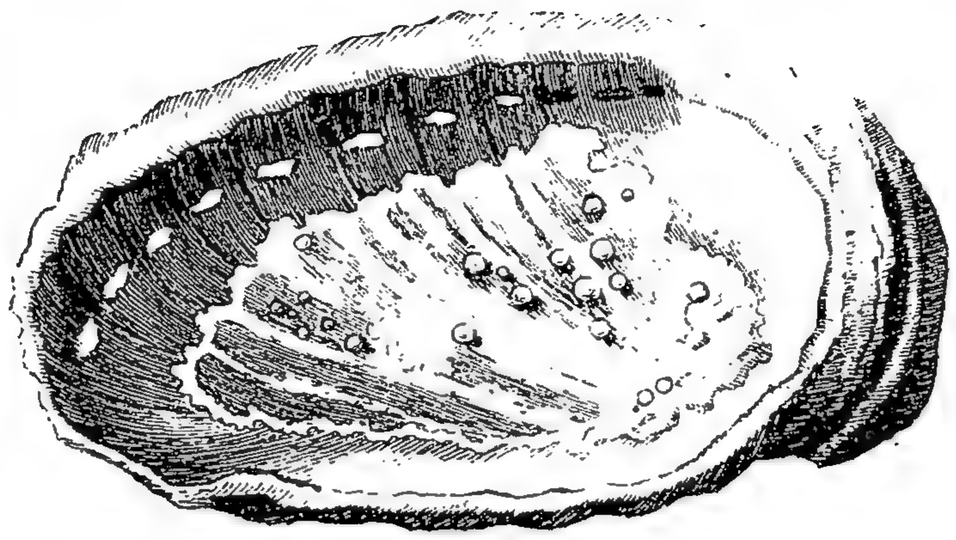


The Hammer Oister



The Map Shell

The White mouthid Yellow Dolium

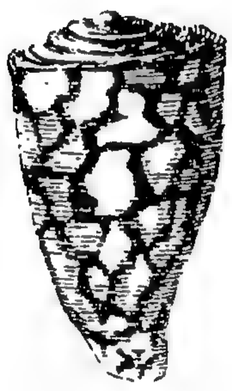


The great Ear Shell

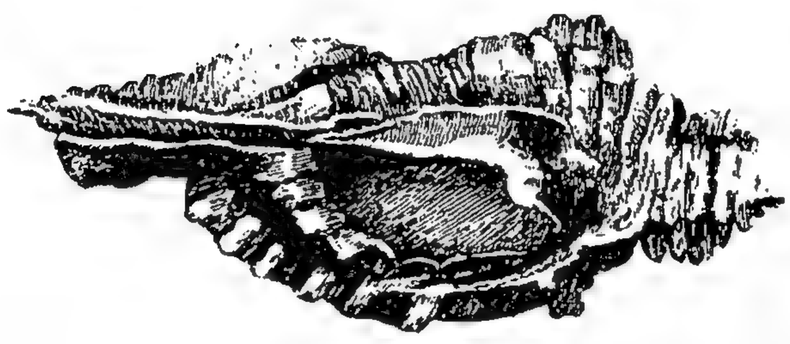
The Olive Shell

The Zizzag Chama

The Golden-mouthid Snail



The Tyger Shell

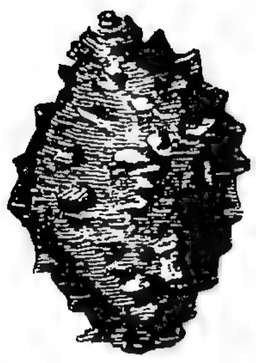


The Rough-mouthid Buccinum

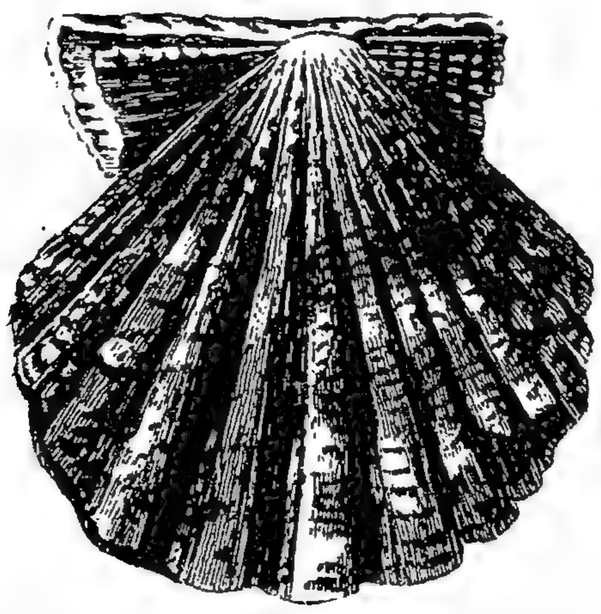
The toothed Nerite Snail

The Purple Magellanick Muscle

The Mitre Shell

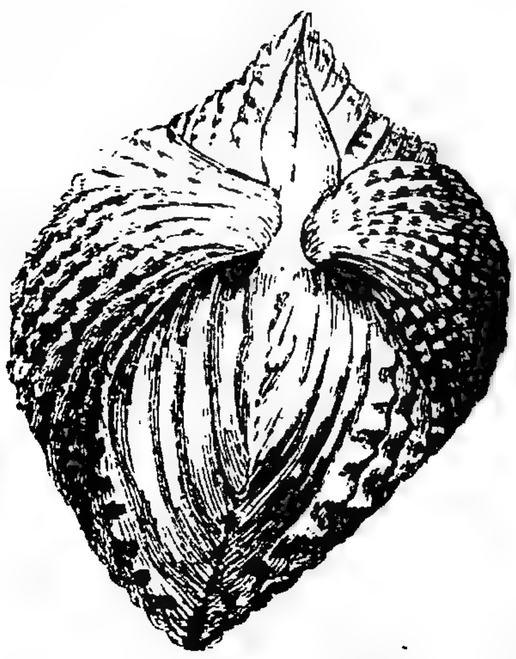


The Mulberry Shell

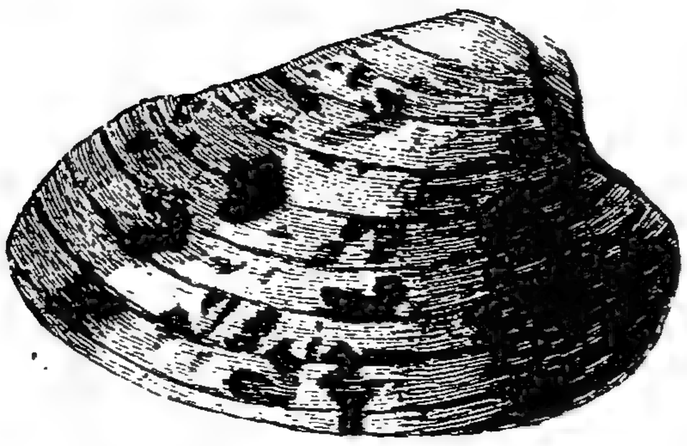


The Ducal Mantle Scallop

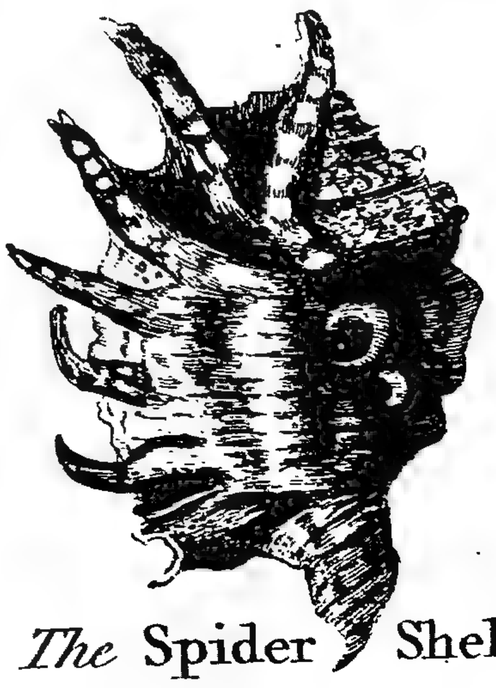
The Old Woman Shell *or wrinkled* Chama



The Noah's Ark Heart Shell



The Agate Chama



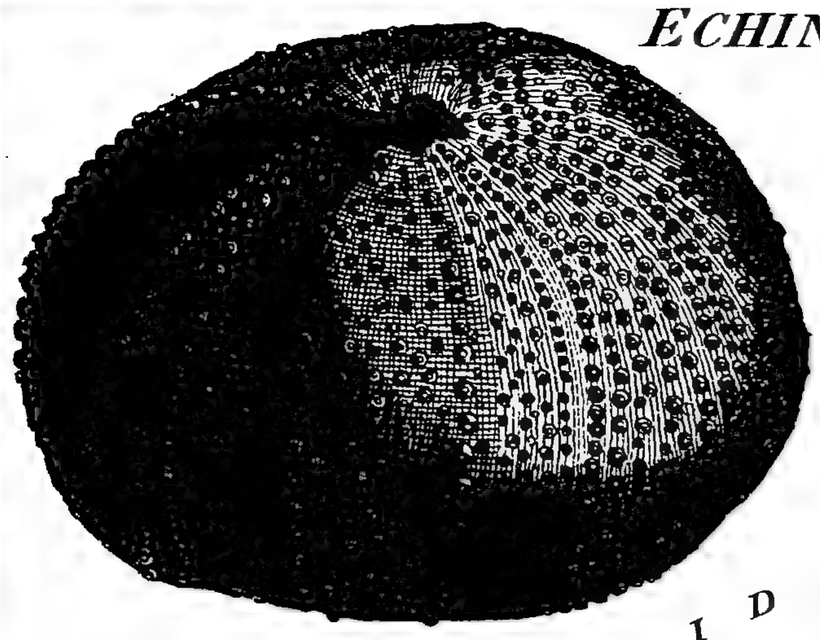
The Spider Shell

London. Published by Alex.r Hogg, at the Kings Arms, N.o 16, Paternoster Row.

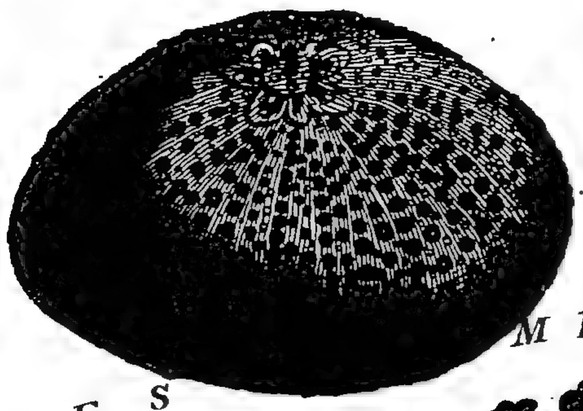
Page sculp.

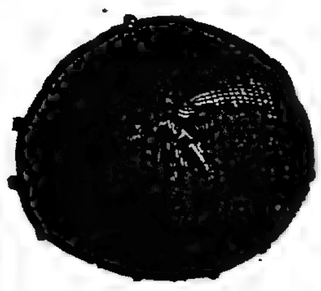
TESTACEOUS ANIMALS.

ECHINODERMATA or SEA URCHINS.



CIDARES





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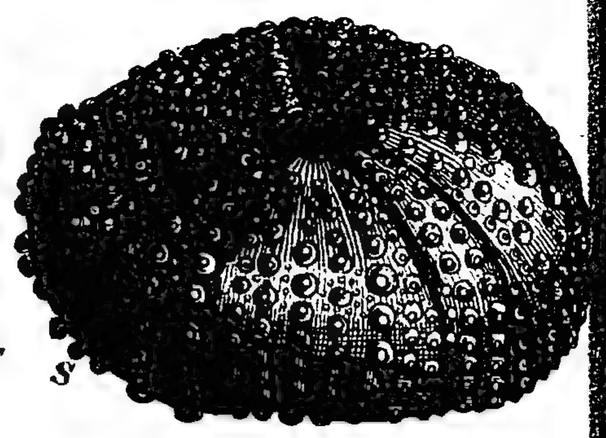

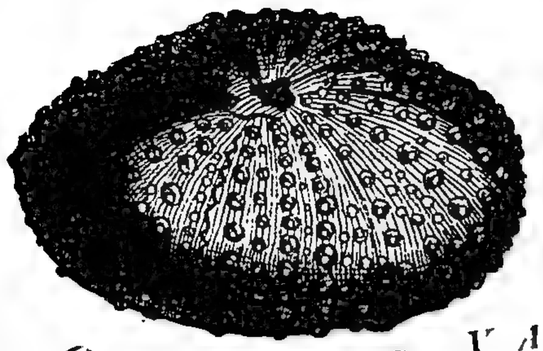

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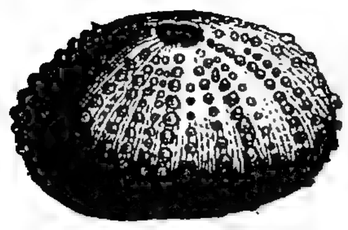

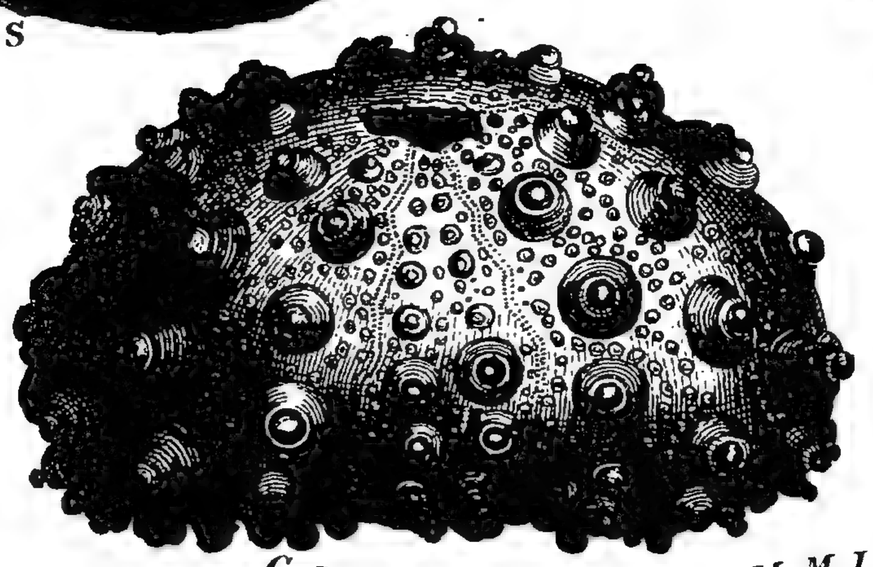

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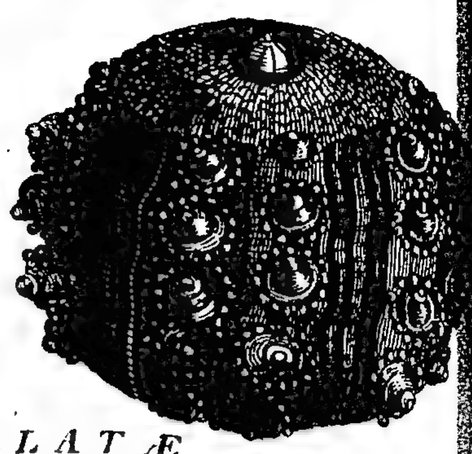

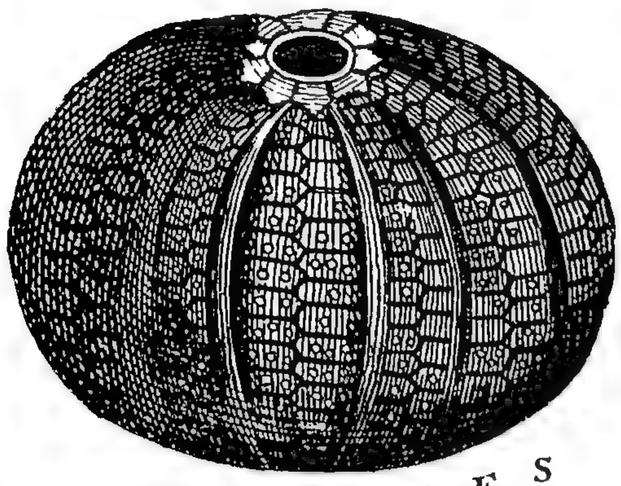

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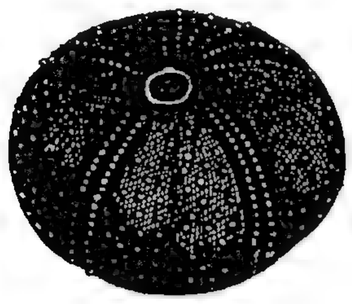

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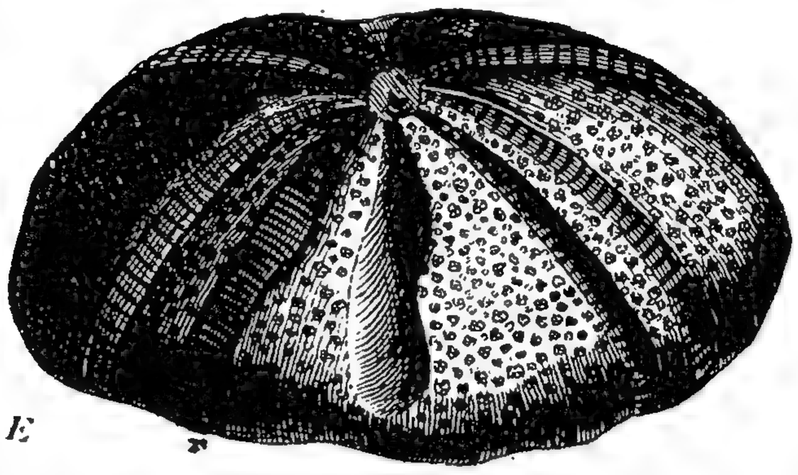

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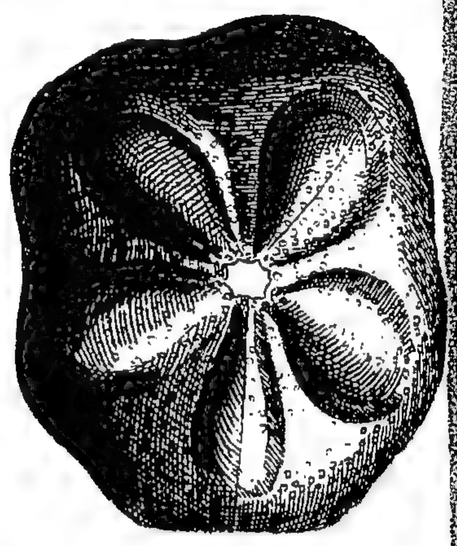


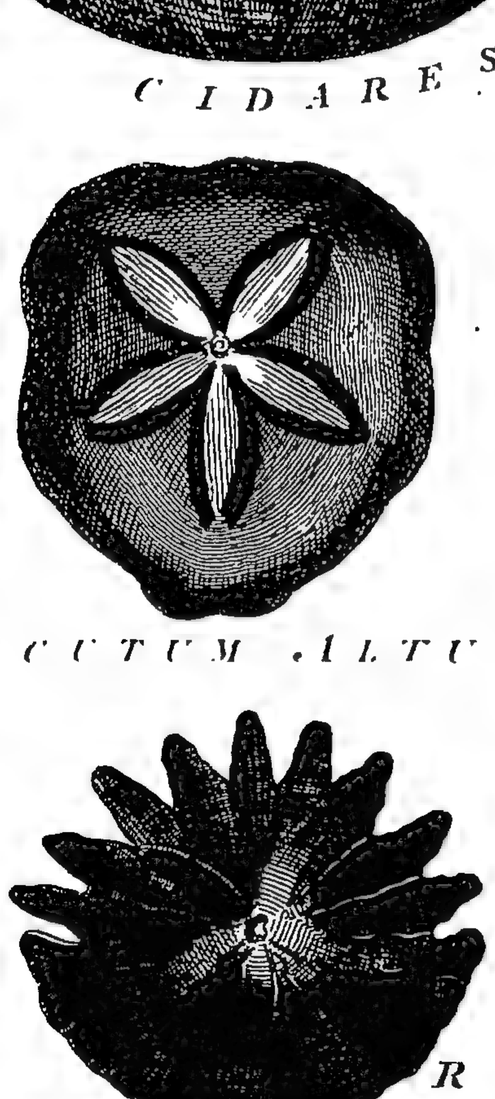
SCUTUM HUMILE

SCUTUM ALTUM

ARACHNOIDES

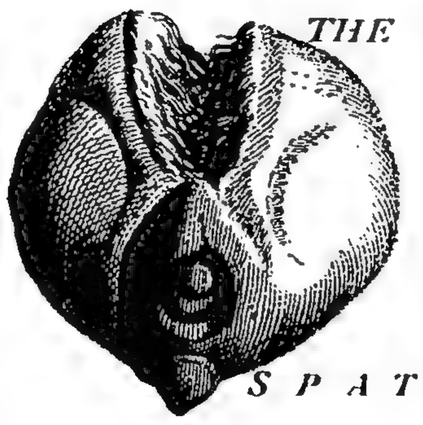
MELLITA

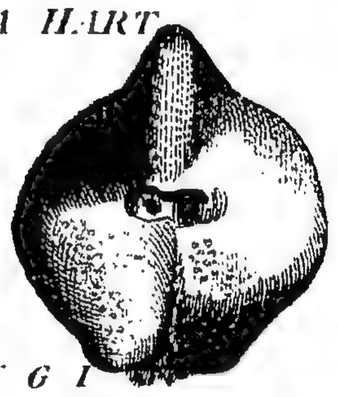
ROTULE



ROTULÆ

THE SEA HART





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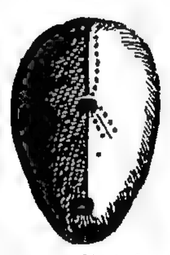
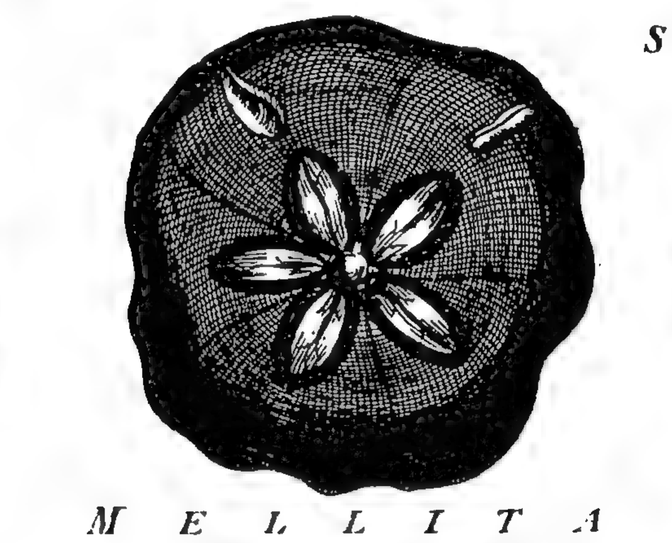


THE SEA EGG

SPATAGOIDES

ECHINOMETRA POMUM MARINUM DICTA



ECHINOMETRA SETACEA

ECHINOMETRA DIGITATA

London: Publish'd by Alex.r Hogg, at the Kings Arms, N.o 16, Paternoster Row.

Grainger s

A VIEW of the PEARL-FISHERY.

Lodge sculp.

are brought from the eaſt: they are whiter and more regular than the American pearls; but they all become yellow in time. When kept in damp places they decay, and moulder into a ſubſtance not much harder than chalk. The greateſt pearl-fiſheries are in America and Aſia; but as pearls are leſs valuable than they formerly were, thoſe of America are in a great meaſure diſcontinued.

Natural History of the SEA URCHIN.

AT the firſt view, the Sea Urchin may be compared to the huſk of a cheſnut; being like it in ſhape, and having a number of bony prickles ſtanding out on every ſide. The mouth is placed downwards; the vent is above; the ſhell is a hollow baſe, reſembling a ſcooped apple, and is filled with a ſoft muſcular ſubſtance, through which the inteſtines wind from the top to the bottom. The mouth, which is large and red, is furniſhed with five ſharp teeth, which are eaſily diſcerned. It is principally remarkable on account of its horns and ſpines, which point from every part of the body, like the horns of a ſnail, and ſerve at once as legs to move upon, as arms to feel with, and as inſtruments of capture and defence.

It is in general obſerved of inſects, that thoſe which have the greateſt number of legs, always move the ſloweſt; this animal, however, is an exception to the general rule; for though it is furniſhed with two thouſand ſpines, and twelve hundred horns, all ſerving for legs, and from their number ſeeming to impede each other's motion, yet it moves at the bottom with ſome degree of ſwiftneſs. Some kinds of this animal are as good eating as the lobſter, and its eggs, which are red, are eſteemed a great delicacy.

The acorn ſhell fiſh, the thumb-footed ſhell fiſh, and the imaginary barnacle, reſemble the Sea Urchin in ſhape, but are very different in motion. They are fixed to one ſpot, and appear to vegetate from a ſtalk. To an inattentive ſpectator, each appears to be a kind of fungus that grows in the deep, deſtitute of animal life as well as motion: but it has a cover, by which it opens and ſhuts its ſhell at pleaſure. It has twelve long crooked arms, furniſhed with hair, which it thruſts forth for its prey; and eight ſmaller, which are generally kept in the ſhell.

But of all animals of the ſhelly tribe, the pholas is the moſt wonderful. The pholas aſſumes different figures; but in general it ſomewhat reſembles a muſcle; except that the ſhell is compoſed of five or more pieces; the ſmaller valves ſerving to cloſe up the openings, left by the irregular meeting of the two principal ſhells. But the moſt wonderful part of their hiſtory is that of their penetrating into rocks, and taking up their reſidence there. When diveſted of its ſhell, this animal reſembles a roundiſh ſoft pudding: it is indeed furniſhed with two teeth; but they are ſo ſituated as to be incapable of touching the hollow ſurface of its ſtony dwelling. The inſtrument with which it performs all its operations, and buries itſelf in the hardeſt rocks, is only a broad fleſhy ſubſtance, reſembling a tongue, which is ſeen iſſuing from the bottom of the ſhell. Thus, furniſhed with the bluntеſt and ſofteſt augre, it effects, by patience and ſucceſſive applications, what other animals are incapable of performing by force; penetrating the hardeſt bodies only with its tongue. It begins to make its way into the ſtone while young and little, by a very narrow entrance; and as it grows bigger, it enlarges its apartments. Here it continues at eaſe for its life; and the ſea-water, which enters at the little aperture, ſupplies it with luxurious plenty.

A

NEW, COMPLETE, and UNIVERSAL BODY, or SYSTEM of NATURAL HISTORY;

Being a Grand, Accurate and Extenſive Diſplay of Animated Nature.

BOOK IV.

Containing the Natural Hiſtory of REPTILES *and* INSECTS.

CHAP. I.

NATURAL HISTORY *of the* FROG, *the* TOAD, *the* PIPAL, *the* NATTER JACK, *the* LIZARD, *the* CROCODILE, *the* SALAMANDER, *the* SCALY LIZARD, *the* TARAQUINA, *the* IGUANA, *the* CAMELEON, *the* VIPER, *the* AMMODYTES, *the* GERENDA, *the* GIBOYA, *the* BOIGUACU, *the* AMPHISBÆNA, *the* DEPONA, *the* RATTLE-SNAKE, *the* SNAKE, *and the* BLIND WORM.

NATURAL HISTORY of the FROG.

THE Frog is an animal too well known to require any deſcription; but ſome of its properties are too ſingular to be paſſed by unnoticed. Compared to the bulk of its body, its leap or ſpring is remarkably great; and it is the beſt ſwimmer of all four-footed animals. For theſe purpoſes nature has finely adapted the parts of this animal; the arms being light and active, the legs and thighs long, and furniſhed with very ſtrong muſcles. Though it may appear ſuperfluous to deſcribe the form of animals ſo well known as the Frog and toad, it may be neceſſary to mark thoſe differences which diſtinguiſh them from each other. The Frog moves by leaping; the toad crawls along the ground: the Frog is in general ſmaller than the toad; it has a brighter colour, and a more poliſhed ſurface: the toad is brown, rough, and duſky. The Frog is light and nimble, and its belly is ſmall, in proportion to the ſize of the animal; the toad is ſlow, corpulent, and heavy. Their internal parts are nearly the ſame, except that the lungs of the toad are more compact than thoſe of the Frog. Neither has the toad ſo many air-bladders as the Frog; conſequently it is leſs fitted for living under water.

The Frog has a very little brain for its ſize; it has a very wide ſwallow; the ſtomach is apparently ſmall, but capable of great diſtention. The heart, like that of all other truly amphibious animals, has but one ventricle; the blood therefore can circulate while it keeps under water, without the aſſiſtance of the lungs. The lungs reſemble a number of ſmall bladders joined together, like the cells of the honey-comb: they are connected to the back by muſcles, and the animal can diſtend or exhauſt them at pleaſure. Theſe are the moſt ſtriking peculiarities in the anatomy of a Frog; in which it agrees with the toad, the lizard, and the ſerpent.

The egg which produces a tadpole, is ſmall, black, and globular, and is ſurrounded with two different kinds of liquor: that which immediately ſurrounds it, is clear and tranſparent, and contained in its proper membrane; that which ſurrounds the whole, is muddy and mucous: the tadpole receives its nouriſhment from the tranſparent liquor, in the ſame manner as young birds are ſupported by the white of the egg. When this membrane is broken, the tadpole adheres with its mouth to part of it for ſome time; and as ſoon as it gets free, ſinks to the bottom of the water; whence it never riſes while it continues in its tadpole ſtate.

When they are releaſed from their tadpole ſtate, they immediately take to land; and, if the weather has been hot, and ſome ſhowers fall to refreſh the earth, the ground is ſometimes ſeen, for a conſiderable ſpace, perfectly blackened by myriads of theſe animalcules, ſeeking for ſome ſecure lurking-places. Hence ſome have imagined that theſe animals were generated in the clouds, and thus ſhowered down on the earth. But had they, like our countryman Derham, traced them to the next pool, they would have found a better ſolution of the difficulty.

The Frog is longer out of the water than in it; but when the cold nights begin to ſet in, it returns to its native element; always chooſing ſtagnant waters,

waters, where it can lie concealed at the bottom.

Frogs, as well as all other reptiles, feed but a ſmall ſpace of the year. During winter, Frogs and toads remain in a torpid ſtate; the latter of which will dig into the earth, and cover themſelves, with almoſt as much agility as the mole.

Frogs live upon inſects of all kinds: they continue motionleſs till their prey appears, and when it comes ſufficiently near, they jump forward with great agility, dart out their tongues and ſeize it. In this animal, as well as in the toad, lizard, and ſerpent kinds, the tongue is extremely long, and formed in ſuch a manner, that it ſwallows the point down its throat. It therefore draws out a length of tongue, like a ſword from a ſcabbard, to aſſail its prey; and whatever inſect touches its tongue, infallibly adheres to it, nature having furniſhed it with a glutinous ſubſtance for that purpoſe.

The croaking of Frogs is well known, and from thence they are diſtinguiſhed by the ludicrous title of Dutch nightingales and Boſton waits in the fenny countries. The aquatic Frogs of Holland, indeed, are loud beyond conception; and though the animal does not exceed a man's fiſt in magnitude, it ſends forth a note that may be heard at the diſtance of three miles. The large water Frogs have a note as loud as the bellowing of an ox, and when they exert it, they puff up their cheeks to an amazing ſize.

Of all Frogs, however, the male only croaks: before wet weather their voices are in full exertion; they are then heard, with unceaſing aſſiduity, ſending forth their call, and welcoming the approaches of their favourite moiſture. Mr. Pennant informs us, that "There is a time of the year when they become mute, neither croaking, nor opening their mouths for a whole month: this happens in the hot ſeaſon, and that is in many places known to the country people by the name of the Paddock-moon."

The male Frog is uſually of a greyiſh brown colour: the female is more inclining to yellow, ſpeckled with brown.

When a Frog is ninety-two days old, two ſmall feet are ſeen towards the tail, and the head appears to be ſeparate from the body. The next day, the legs are conſiderably enlarged; and four days after that, it refuſes all vegetable food; its mouth appears furniſhed with teeth; and its hinder legs are completely formed: the arms are completely produced in two days more; and the animal is then entirely perfect, except that it ſtill continues to carry the tail: that, however, drops off by degrees, and in the ſpace of a few days, no part of it remains.

With its figure, the Frog alſo changes its appetites; and, ſo extraordinary is this transformation, that it immediately rejects the food it greedily fed on a few days before; it would even ſtarve if no other could be procured. When the animal acquires its perfect ſtate, it becomes carnivorous, living entirely upon worms and inſects, though before that time it fed entirely upon vegetables. Theſe, however, are not to be found in the water; it is therefore obliged to quit its native element, and hunt after food upon land. At firſt it is too feeble to endure the warmth of the ſun, and therefore conceals itſelf among buſhes, and under ſtones; but when the earth is refreſhed by a ſhower, they immediately quit their retreats, in order to enjoy the grateful humidity.

We ſhall conclude our deſcription of the Frog, with an obſervation of the great Swammerdam, in his book of Nature. "As we ſee inſects loſe many parts with their old ſkin, this is likewiſe the caſe in the Frog; which, beſides other things, plainly caſts off its mouth and tail; ſo that, however admirable the art, order, conſtruction, and parts of its members may appear to be; yet the nerves, arteries, veins, cartilages, muſcles, and many other remarkable parts, which gradually vaniſh, and are, as it were, become inſenſible, are deſtroyed at once, ceaſe their motions, and ſtop their ſeveral functions, on the change. Are not theſe changes admirable? And do not they lay before our eyes the omnipotent hand of God, conſpicuous in his inacceſſible radiancy and infinite majeſty? He, in this caſe, forms another out of one and the ſame animal, which, though different in appearance, yet remains one and the ſame creature. May not the *reſurrection of the dead be exemplified in this illuſtrious inſtance?* all this is very elegantly manifeſted in various inſects."

Natural History of the TOAD.

THE Toad, a well known animal; alſo called rubeta, rana rubeta. The Toad is of the frog kind, and of the number of thoſe animals which have only one ventricle in the heart. It reſembles the frog, but its belly is more inflated, and ſkin more full of tubercles: it is of an aſh colour, with brown, blackiſh, and yellow ſpots. It does not croak like the frog, but makes an indiſtinct noiſe that is obſcure, and like the word geu, or rather bu, from which ſome ſuppoſe it is called bufo. It is ſaid to have its name rubeta from rubus, becauſe it is often found under bramble-buſhes.

The Toad, ſays Mr. Pennant, is the moſt deformed and hideous of all animals; the body broad, the back flat, and covered with a pimply duſky hide; the belly large, ſwagging, and ſwelling out, the legs ſhort, and its pace laboured and crawling; its retreat gloomy and filthy: in ſhort, its general appearance is ſuch, as to ſtrike one with diſguſt and horror; yet we have been told by thoſe who have reſolution to view it with attention, that its eyes are fine: to this it ſeems that Shakeſpeare alludes, when he makes his Juliet remark,

Some ſay the lark and loathed Toad change eyes.

As if they would have been better beſtowed on ſo charming a ſongſter than on this raucous reptile.

But the hideous appearance of the Toad is ſuch, as to make this one advantageous feature overlooked, and to have rendered it, in all ages, an object of horror, and the origin of moſt tremendous inventions. Ælian makes its venom ſo potent, that, baſiliſk-like, it conveyed death by its very look and breath; but Juvenal is content with making the Roman ladies, who were weary of their huſbands, form a potion from its entrails, in order to get rid of the good man.

To quench the huſband's parching thirſt, is brought
By the great dame, a moſt deceitful draught;
In rich Calenian wine ſhe does infuſe
(To eaſe his pain) the Toad's envenom'd juice.

This opinion begat others of a more dreadful nature; for in after-times ſuperſtition gave it preternatural powers, and made it a principal ingredient in the incantations of nocturnal hags:

Toad that under the cold ſtone,
Days and nights has thirty-one,
Swelter'd venom ſleeping got,
Boil thou firſt i'th' charmed pot:

We know by the poet, that this charm was intended for a deſign of the firſt conſideration, that of raiſing the dead from their repoſe, and bringing before the eyes of Macbeth a hateful ſecond ſight of the proſperity of Banquo's line.

This

This ſhews the mighty powers attributed to this animal by the dealers in the magic art; but the powers our poet endues it with, are far ſuperior to thoſe that Geſner aſcribes to it: Shakeſpeare's witches uſed it to diſturb the dead; Geſner's only to ſtill the living.

We may add here another ſuperſtition in reſpect to this animal: it was believed by ſome old writers, to have a ſtone in its head, fraught with great virtues, medical and magical: it was diſtinguiſhed by the name of the reptile, and called the toad-ſtone, bufonites, crapaudine, krottenſtein; but all its fancied powers vaniſhed, on the diſcovery of its being nothing but the foſſil-tooth of the ſea-wolf, or of ſome flat-toothed fiſh, not unfrequent in our iſland, as well as in ſeveral other countries; but we may well excuſe this tale, ſince Shakeſpeare has extracted from it a ſimile of uncommon beauty:

Sweet are the uſes of adverſity,
Which like the Toad, ugly and venomous,
Wears yet a precious jewel in his head.

But theſe fables have been long exploded: we ſhall now return to the notion of its being a poiſonous animal; and deliver, as our opinion, that its exceſſive deformity, joined to the faculty it has of emitting a juice from its pimples, and a duſky liquid from its hind parts, is the foundation of the report.

That it has any noxious qualities, we have been unable to bring proofs in the ſmalleſt degree ſatisfactory, though we have heard many ſtrange relations on that point.

On the contrary, we know ſeveral of our friends, who have taken them in their naked hands, and held them long, without receiving the leaſt injury: it is alſo well known that quacks have eaten them, and have, beſides, ſqueezed their juices into a glaſs, and drank them with impunity.

We may ſay alſo, that theſe reptiles are a common food to many animals; to buzzards, owls, Norfolk plovers, ducks, and ſnakes, who would not touch them, were they in any degree noxious.

So far from having venomous qualities, they have of late been conſidered as if they had beneficent ones. We wiſh, for the benefit of mankind, that we could make a favourable report of the many attempts of late to cure the moſt terrible of diſeaſes, the cancer, by the application of live toads; but alas, they ſeem only to have rendered a horrible complaint more loathſome.

In a word, we may conſider the Toad as an animal that has neither good nor harm in it; that being a defenceleſs creature, nature has furniſhed it, inſtead of arms, with a moſt diſguſting deformity, that ſtrikes into almoſt every being capable of annoying it, a ſtrong repugnancy to meddle with ſo hideous and threatening an appearance.

The time of their propagation is very early in the ſpring: at that ſeaſon the females are ſeen crawling about oppreſſed by the males, who continue on them for ſome hours, and adhere ſo faſt, as to tear the very ſkin from the parts they ſtick to. We are uncertain whether they are viviparous: Linnæus ſays they are, and diverts us with a report he had heard, that the male acts the midwife to the female in parturition.

To conclude this account with the marvellous, this animal is ſaid to have often been found in the midſt of ſolid rocks, and even in the centre of growing trees, impriſoned in a ſmall hollow, to which there was not the leaſt adit or entrance: how the animal breathed, or how it ſubſiſted (ſuppoſing the poſſibility of its confinement) is paſt our comprehenſion. Plot's ſolution of this phænomenon is far from ſatisfactory; yet as we have the great Bacon's authority for the fact, we do not entirely deny our aſſent to it. *Britiſh Zoology*, vol. iii. p. 7.

There is a very poiſonous ſpecies in America, called cururu by the Braſilians, and capo by the Portugueſe.

The common Toad was firſt introduced into medicine upon a cure being performed on an hydropic perſon, to whom powdered Toads were given, in order to diſpatch him, but he voided a large quantity of urine after taking it, and ſoon recovered of his diſorder. Since this, Toads, gently dried and powdered, have been uſed as a diuretic; but the preſent practice is quite unconcerned with them.

In the cure of a cancer, ſays Etmuller, and more particularly unexulcerated cancers in the breaſts of women, Toads are of ſingular ſervice, either calcined alone, or dried to ſuch a degree, that they may be reduced to a powder. The method of applying this powder, is to ſprinkle it on the part affected. This powder may alſo be mixed with orpiment and ſoot, and applied, when ſpread, upon a pledget moiſtened with ſaliva. We are alſo told, that many patients labouring under epidemical dyſenteries, have been happily recovered by the uſe of this powder, which operates as a ſudorific. Some preſcribe half a dram of it, and upwards, in the ſmall-pox. D. Carlius recommends the powder of calcined Toads, mixed with the powder of blue linen cloth burnt, in epilepſies of adult perſons, attended with an inſpiſſation of the juices; and affirms, that as much of it as may be taken at twice upon the point of a ſmall knife, has in ſome epileptic patients produced the moſt happy and ſurprizing effects. He alſo informs us that a doſe from ten to twenty grains of the powder of calcined Toads, exhibited internally, wonderfully mitigates arthritic pains, and more eſpecially thoſe with which wounds are attended.

We have an account of two boys, who towards the latter end of a peſtilential diſorder, in which they had been long afflicted with carbuncles, together with an univerſal anaſarca and dropſy, were cured by a plentiful diureſis excited by the powder of Toads, mixed with ſalt of wormwood, daily exhibited.

The diaphoretic virtue of this powder, by which it muſt of courſe contribute to the cure of a dropſy, was accidentally diſcovered, as Boecler from Solenander informs us in the following hiſtory. At Rome a certain man had the misfortune to be afflicted with a dropſy, and his wife, thinking much of the expences attending his cure, maliciouſly reſolved to poiſon him; for which purpoſe ſhe gave him a doſe of the powder of a Toad, calcined in an earthen veſſel, by which means a very plentiful diſcharge of urine was occaſioned. But the wife, heartily wearied of ſo uſeleſs and expenſive a huſband, was exceedingly deſirous to put an end to his miſerable life by a ſudden death. With this view, ſhe exhibited the ſame powder a ſecond time, by which means the waters were plentifully diſcharged by urine, and the patient cured. Thus her views were diſappointed, and what was intended for a poiſon, happily proved a noble and efficacious medicine.

The following remarkable particulars were communicated in a letter from J. Arſcott, Eſq; of Tabott, in Devonſhire, to Mr. Pennant. "It would give me, ſays he, the greateſt pleaſure to be able to inform you of any particulars concerning the Toad who lived for many years with us, and was ſo great a favourite. The greateſt curioſity in it, was its becoming ſo remarkably tame. It had frequented ſome ſteps before the hall door, ſome years before my acquaintance commenced with it, and had been admired by my father for its ſize (which was of the

largeſt

largeſt I ever met with) who conſtantly paid it a viſit every evening. I knew it myſelf above thirty years, and by conſtantly feeding it, brought it to be ſo tame, that it always came to the candle, and looked up, as if expecting to be taken up and brought upon the table, where I always fed it with inſects of all ſorts: it was fondeſt of fleſh maggots, which I kept in bran; it would follow them, and when within a proper diſtance, would fix its eye, and remain motionleſs for near a quarter of a minute, as if preparing for the ſtroke, which was an inſtantaneous throwing its tongue at a great diſtance upon the inſect, which ſtuck to the tip by a glutinous matter: the motion is quicker than the eye can follow.

"I always imagined that the root of its tongue was placed in the fore part of its under jaw, and the tip towards its throat, by which the motion muſt be a half circle; by which, when its tongue recovered its ſituation, the inſect at the tip would be brought to the place of deglutition. I was confirmed in this, by never obſerving any internal motion in its mouth, excepting one ſwallow, the inſtant its tongue returned. Poſſibly I might be miſtaken, for I never diſſected one, but contented myſelf with opening its mouth, and ſlightly inſpecting it.

"You may imagine that a Toad, generally deteſted (although one of the moſt inoffenſive of all animals) ſo much taken notice of and befriended, excited the curioſity of all comers to the houſe, who all deſired to ſee it fed; ſo that even ladies ſo far conquered the horrors inſtilled into them by nurſes, as to deſire to ſee it. This produced innumerable and improbable reports, making it as large as the crown of a hat, &c. &c. This I hope will account for my not giving you particulars more worth your notice. When I firſt read the account in the papers of Toads ſucking cancerous breaſts, I did not believe a word of it, not thinking it poſſible for them to ſuck, having no lips to embrace the part, and a tongue ſo oddly formed; but as the fact is thoroughly verified, I moſt impatiently long to be fully informed of all particulars relating to it."

Mr. Arſcott, in a ſecond letter to the ſame gentleman, mentions among others, the following additional particulars, in anſwer to ſome queries propoſed by him. "I cannot ſay how long my father had been acquainted with the Toad, before I knew it; but when I firſt was acquainted with it, he uſed to mention it as the old Toad I've known ſo many years; I can anſwer for thirty-ſix years.

"No Toads that ever I ſaw appeared in the winter ſeaſon. The old Toad made its appearance as ſoon as the warm weather came, and I always concluded it retired to ſome dry bank to repoſe till the ſpring. When we new-laid the ſteps, I had two holes made in the third ſtep on each, with a hollow of more than a yard long for it, in which I imagine it ſlept, as it came from thence at its firſt appearance.

"It was ſeldom provoked: neither that Toad (nor the multitudes I have ſeen tormented with great cruelty) ever ſhewed the leaſt deſire of revenge, by ſpitting or emitting any juice from their pimples.

"A Toad has no particular enmity for the ſpider.

"I hardly remember any perſons taking it up, except my father and myſelf: I do not know whether it had any particular attachment to us.

"In reſpect to its end, I anſwer this laſt query. Had it not been for a tame raven, I make no doubt but it would have been now living; who one day ſeeing it at the mouth of its hole, pulled it out, and, although I reſcued it, pulled out one eye, and hurt it ſo, that notwithſtanding its living a twelvemonth, it never enjoyed itſelf, and had a difficulty of taking its food, miſſing the mark for want of its eye. Before that accident, it had all the appearance of perfect health."

It is ſaid, that cancerous complaints may be cured by a Toad. It is, however, certain, great relief has been obtained by that animal's ſucking a cancerous breaſt. The whole of the animal, except its head, is put into a linen bag, and the head is held to the part. It generally ſeizes the fouleſt part of the ſore in an inſtant, and ſucks with greedineſs, till it drops off dead. It frequently happens, that the creature ſwells immenſely. Some have lived above a quarter of an hour after ſucking; others much longer. Some have been known to ſuck upwards of four hours, and then dropped dead from the wound, ſwelled exceedingly, and turned of a pale colour. During the time of their ſucking, they are heard to ſmack their lips like a young child.

Natural History of the PIPAL, or SURINAM TOAD.

THE form of this animal is even more hideous than that of the common Toad: the body is flat and broad; the head ſmall; the ſkin of the neck forms a kind of wrinkled collar; the colour of the head is of a dark cheſnut; and the eyes are ſmall: the back is of a lightiſh grey, and ſeems covered with a number of ſmall round eyes, placed at nearly equal diſtances. The ſe eyes are very different from what they ſeem; for they are the animal's eggs, covered with their ſhells, and placed there for hatching. Theſe eggs are buried deep in the ſkin, and hardly appear in the beginning of incubation; but they are very viſible when the young animal is about to burſt from its confinement. Their colour is a yelloviſh red, and the ſpaces between them are full of ſmall warts, reſembling pearls. In all nature, there is not perhaps a more extraordinary phænomenon, than that of an animal breeding and hatching its young in its back; from whence, when arrived at maturity, they crawl out one after the other. This animal, like the reſt of the frog kind, is moſt probably harmleſs; though we are told of terrible effects reſulting from its powder when calcined.

Natural History of the NATTER JACK.

THIS animal neither leaps, nor crawls with the ſlow pace of the toad, but its motion rather reſembles running. The upper part of the body is of a dirty yellow, clouded with brown: it is covered with porous pimples of unequal ſizes. The Natter Jack has a yellow line on the back: it has four divided toes on the fore feet, and five on the hind feet a little webbed. It frequents dry and ſandy places.

Of LIZARDS in General.

IT is difficult to ſay to what claſs in nature Lizards are chiefly allied. They cannot properly be raiſed to the rank of beaſts as they bring forth eggs, diſpenſe with breathing, and are not cloathed with hair. They cannot be ranked with fiſhes, as the majority of them live upon land: their feet, upon which they run with great celerity, exclude them from the ſerpent tribe; and they cannot be placed among inſects, on account of their ſize. But, tho' the Lizard is in ſome meaſure excluded from every rank, it exhibits ſomewhat of the properties of all: it has the legs and celerity of the quadruped; the facility of creeping through narrow and intricate ways,

ways, like the ſerpent; and the power of living in the water like the fiſh.

Lizards not only differ from every other claſs of animals, but they alſo differ widely from each other: with reſpect to ſize, no claſs of beings has its ranks ſo oppoſite. What can be more removed than the ſmall cameleon of an inch long, and the alligator above twenty-ſeven feet. Their colour is alſo very various: they are found of a green, blue, red, cheſnut, yellow, ſpotted, ſtreaked, and marbled. If colour alone could conſtitute beauty, the Lizard would often pleaſe; but there is ſomething ſo repreſſing in its figure, that the brilliancy of its ſcales, or the variety of its ſpots, cannot make it a deſirable object to behold.

But animals of the Lizard kind, are principally diſtinguiſhed by the manner of bringing forth their young. The crocodile, the iguana, and all the larger kinds, bring forth eggs, which are hatched by the heat of the ſun: their produce are complete upon leaving the ſhell; and their firſt efforts are to run to ſeek food in their proper element. The viviparous kinds, in which are all the ſalamanders, are produced alive by the female, perfect and active, and ſuffer no ſucceeding change. But thoſe which are bred in the water, ſuffer a very conſiderable change in their form. They are produced with an external ſkin or covering, which ſometimes encloſes their feet, and gives them a ſerpentine appearance. Above and below their tail, fins are added to this falſe ſkin, that ſerve the animal for ſwimming; theſe, and the falſe ſkin, drop off together; and the lizard has four feet, is completely formed, and forſakes the water.

The three kinds, however, have many points of ſimilitude: they have all four ſhort legs: they have tails which are thick at the beginning, and run tapering to a point: they are all amphibious, and equally capable of living upon land and in the water; and they are all formed internally in the ſame manner as the tortoiſe, and other animals that can continue a long time without reſpiration.

NATURAL HISTORY of the CROCODILE.

THIS animal is placed at a happy diſtance from the inhabitants of Europe. To look for the Crocodile in all its natural terrors, grown to an enormous ſize, and committing unceaſing devaſtations, we muſt go to the uninhabited regions of Africa, and America. In the river Amazons, or the river Niger, they are found from eighteen to twenty-ſeven feet in length; and ſometimes lying as cloſe to each other, as a raft of timber in the Thames.

Of this animal there are two kinds; the Crocodile, properly ſo called, and the cayman or alligator. Travellers, however, have rather made the diſtinction than nature; for in the general outline, and in the nature of theſe two animals, they are entirely the ſame. It would be ſpeaking more properly to call theſe animals, the Crocodiles of the eaſtern and the weſtern world; for in books of voyages, they are ſo entirely confounded together, that there is no knowing whether the Aſiatic animal be the Crocodile of Aſia, or the alligator of the weſtern world. The uſual diſtinctions between the Crocodile and alligator are theſe: the body of the Crocodile is more ſlender than that of the alligator; it's ſnout runs off tapering from the forehead, like that of a greyhound; while that of the other is indented like the noſe of a lap-dog. The Crocodile has a much wider ſwallow, and is of an aſh colour; the alligator is black, varied with white, and is ſaid to be leſs miſchievous.

The Crocodile grows to a great length, ſometimes exceeding thirty feet long, from the tip of the ſnout to the end of the tail: its moſt uſual length, however, is eighteen. They are ſeen in ſome places lying for whole hours, and even days ſtretched in the ſun and motionleſs; ſo that a perſon unacquainted with the ſight, might miſtake them for trunks of trees, covered with a rough and dry bark; but the miſtake would ſoon be fatal, if not prevented: for the torpid animal at the near approach of any living thing, darts upon it with inſtant ſwiftneſs, and at once drags it down to the bottom. In the times of an inundation they ſometimes enter the cottages of the natives, where the dreadful viſitant ſeizes the firſt animal it meets with. There have been ſeveral examples of their taking a man out of a canoe in the ſight of his companions, without their being able to afford him the leaſt aſſiſtance.

Every part of the Crocodile is remarkably ſtrong; and its arms both offenſive and defenſive are irreſiſtible. We have ſeen, from the ſhortneſs of its legs, the amazing ſtrength of the tortoiſe: but how inſignificant is the ſtrength of ſuch an animal, compared to that of the Crocodile, whoſe legs are very ſhort, and whoſe ſize is ſo ſuperior? The backbone is jointed in the firmeſt manner; the muſcles of the fore and hinder legs are vigorous and ſtrong; and its whole form finely calculated for force. Its teeth are ſharp, numerous, and formidable; its claws are long and tenacious; but its principal inſtrument of deſtruction is the tail; with a ſingle blow of which it has frequently overturned a canoe, and ſeized upon the poor ſavage who was the conductor of it.

Though leſs powerful upon land, the Crocodile is terrible even there. It ſeldom leaves the water, except when preſſed by hunger, or with a view of depoſiting its eggs. It uſually floats along upon the ſurface, and ſeizes whatever animals come within its reach; but when this method fails, it then goes nearer to the bank. Diſappointed of its fiſhy prey, it there waits covered up among the ſedges, in patient expectation of ſome land animal that comes to drink; the dog, the bull, the tiger, or man himſelf. Nothing is to be ſeen of the inſidious deſtroyer as the animal approaches; nor is its retreat diſcovered till it be too late to eſcape its fury. It ſeizes the victim with a ſpring, and goes at a bound much faſter than ſo unweildy an animal could be thought capable of exerting; then having ſecured the creature with both teeth and claws, it drags it into the water, ſinks with it to the bottom, and drowns it in an inſtant.

The animal which the Crocodile has thus ſurpriſed, ſometimes, indeed, eſcapes from its graſp, wounded, and makes off from the river-ſide. The tyrant, however, purſues with all its force, and often ſeizes it a ſecond time. Thus it is frequently ſeen above half a mile from the bank, in purſuit of ſome animal, which it has wounded beyond the power of eſcaping, and then dragging it back to the ſhore, where it feaſts in ſecurity.

In its depredations along the bank, the Crocodile ſometimes ſeizes on a creature as formidable as itſelf, and meets with a moſt deſperate reſiſtance. Frequent combats happen between the Crocodile and the tiger. Creatures of the tiger kind are continually oppreſſed by a parching thirſt, which keeps them always in the vicinity of great rivers, whither they deſcend to drink very frequently. Upon theſe occaſions they are ſeized by the Crocodile; and they die not unrevenged. The inſtant they are ſeized upon, they turn with the greateſt agility, and force their claws into the Crocodile's eyes, while he plunges with his fierce antagoniſt into the river. There they continue to ſtruggle for ſome time, till at laſt the tiger is drowned.

The

The Crocodile thus ſeizes and deſtroys every animal, and is equally dreaded by all. Man alone can combat it with ſucceſs. Labat aſſures us, that a negro, with no other weapons than a knife in his right hand, and his left arm wrapped round with a cow's hide, ventures boldly to attack this animal in its own element. As ſoon as he approaches the Crocodile, he preſents his left arm, which the animal moſt greedily ſwallows; but ſticking in its throat, the negro has time to give it ſeveral ſtabs under the throat; and the water alſo getting in it at the mouth, which is held involuntarily open, the creature ſoon becomes ſwelled as large as a tun, and expires.

To thoſe who live at a diſtance from the rapacity of theſe animals, theſe ſtories appear ſtrange and romantic. From not having ſeen any thing ſo formidable in the circle of their own experience, they ſhould not, however, determine upon the wonderful tranſactions in diſtant climates. It is probable that theſe, and many other dreadful encounters, happen every day among thoſe foreſts and in thoſe rivers, where the moſt formidable animals are known to reſide; where the elephant and the rhinoceros, the tiger and hippopotame, the ſhark and the Crocodile, have frequent opportunities of meeting, and renewing their engagements.

Crocodiles are taken by the Siameſe in great abundance. The natives of that empire are particularly fond of the capture of all the great animals with which their country abounds. The manner of taking the Crocodile in Siam, is by throwing three or four ſtrong nets acroſs a river, at proper diſtances from each other; ſo that if the animal breaks through the firſt, it may be caught by one of the reſt. When it is firſt taken, it employs the tail with great force; but after many unſucceſsful ſtruggles, the animal's ſtrength becomes exhauſted. Then the natives approach their priſoner in boats, and pierce him with their weapons in the moſt tender parts till he is weakened with the loſs of blood. When he has done ſtirring, they begin by tying up his mouth, and with the ſame cord they faſten his head to his tail, which laſt they bend back like a bow. However, they are not yet perfectly ſecure from his fury; but, for their greater ſafety, they tie his fore-feet, as well as thoſe behind, to the top of his back. Theſe precautions are not uſeleſs; for if they were to omit them, the Crocodile would ſoon recover ſtrength enough to do conſiderable miſchief.

The Crocodile thus brought into ſubjection, or bred up young, is uſed to divert and entertain the great men of the Eaſt. It is often managed like an horſe; a curb is put into its mouth, and the rider directs it as he thinks proper. Though aukwardly formed, it proceeds with ſome degree of ſwiftneſs; and is thought to move as faſt as ſome of the moſt unweildy of our own animals, the hog or the cow. Some, indeed, aſſert that no animal could eſcape it, but for its difficulty in turning; but to this reſource we could wiſh none would truſt, who are ſo unhappy as to find themſelves in danger.

In the rivers of Africa the Crocodile is ſometimes taken in the ſame manner as the ſhark. Several Europeans go together in a large boat, and throw out a piece of beef upon a hook and ſtrong fortified line, which the Crocodile ſeizing and ſwallowing, is drawn along, floundering and ſtruggling till its ſtrength is quite exhauſted, when it is pierced in the belly, which is its tendereſt part; and thus after numberleſs wounds is drawn aſhore. In this part of the world alſo, as well as at Siam, this animal makes an object of ſavage pomp near the palaces of their monarchs. Philips informs us, that at Sabi, on the ſlave coaſt, there are two pools of water near the royal palace, where Crocodiles are bred as we breed carp in our European ponds.

Hitherto we have deſcribed the Crocodile as it is found in unpeopled countries, and undiſturbed by frequent encounters with mankind. In this ſtate it is fierce and cruel, attacking every object that ſeems endued with motion: but in Egypt, and other countries long peopled, where the inhabitants are civilized and the rivers frequented, this animal is ſolitary and timid. Inſtead of coming to attack a man, it ſinks at his approach with the utmoſt precipitation; and, as if ſenſible of ſuperior power, ever declines the engagement. We have many inſtances, in animated nature, of the contempt which at firſt the lower orders of the creation have for man, till they have experienced his powers of deſtruction. The lion and the tiger among beaſts, the whale among fiſhes, the albatroſs and the penguin among birds, meet the firſt encounters of man without dread or apprehenſion; but they ſoon learn to acknowledge his ſuperiority; and take refuge from his power in the deepeſt receſſes of nature. This may account for the different characters which have been given us of the Crocodile and the alligator by travellers at different times: ſome deſcribing them as harmleſs and fearful, as ever avoiding the ſight of a man, and preying only upon fiſhes; others ranking them among the deſtroyers of nature; deſcribing them as furniſhed with ſtrength, and impelled by malignity to do miſchief; repreſenting them as the greateſt enemies of mankind, and particularly deſirous of human prey. The truth is, the animal has been juſtly deſcribed by both; being ſuch as it is found in places, differently peopled or differently civilized. Wherever the Crocodile has reigned long unmoleſted, it is fierce, bold, and dangerous; wherever it has been harraſſed by mankind, its retreats invaded, and its numbers deſtroyed, it is there timorous and inoffenſive.

Inſtead of being formidable, this animal in ſome places is not only inoffenſive, but is cheriſhed and admired. In the river San Domingo, the Crocodiles are the moſt inoffenſive animals in nature; the children play with them, ride about on their backs, and even beat them ſometimes without receiving the ſmalleſt injury. The inhabitants indeed are very careful of this gentle breed, and conſider them as harmleſs domeſtics.

It is perhaps the ſmell of muſk, which all theſe animals exhale, that renders them agreeable to the ſavages of that part of Africa. They are often known to take the part of this animal which contains the muſk, and wear it as a perfume about their perſons. Travellers are not agreed in what part of the body theſe muſk-bags are contained; ſome ſay in the ears; ſome, in the parts of generation; but the moſt probable opinion is, that this muſky ſubſtance is amaſſed in glands under the legs and arms. From whatſoever part of the body this odour proceeds, it is very ſtrong and powerful, tincturing the fleſh of the whole body with its taſte and ſmell. This animal's fleſh is at beſt very indifferent eating; but unleſs the muſk-bags be ſeparated it is inſupportable. The negroes themſelves cannot well digeſt the fleſh; but they conſider a Crocodile's egg as the moſt delicate morſel in the univerſe.

Crocodiles always breed near freſh waters; and though they are ſometimes found in the ſea, yet that may be conſidered rather as a place of excurſion than abode. They produce their young by eggs; for which purpoſe the female, when ſhe comes to lay, chuſes a place by the ſide of a river, or ſome freſh-water lake, to depoſit her brood in. She always pitches upon an extenſive ſandy ſhore. The ſhore muſt alſo be gentle and ſhelving to the water, for

for the greater convenience of the animal's going and returning; and a convenient place muſt be found near the edge of the ſtream, that the young may have a ſhorter way to go. When all theſe requiſites are adjuſted, the animal is ſeen cautiouſly ſtealing up on ſhore to depoſit her burden. The preſence of a man, a beaſt, or even a bird, is ſufficient to deter her at that time; and if ſhe perceives any creature looking on, ſhe infallibly returns. But if nothing appears, ſhe begins ſcratching up the ſand with her fore paws, and making a deep hole in the ſhore. There ſhe depoſits from eighty to an hundred eggs, of the ſize of a tennis-ball, and of the ſame figure, encloſed in a tough white ſkin like parchment. She takes above an hour to perform this taſk; and then covering up the place ſo artfully that it can ſcarcely be perceived, ſhe goes back to return again the next day. On her return, ſhe lays about the ſame number of eggs; and as many the day following. Thus having depoſited her whole quantity, and having covered them cloſe up in the ſand, they are ſoon vivified by the heat of the ſun; and at the end of thirty days, the young ones begin to break open the ſhell. The female is then inſtinctively taught that her young ones require relief; ſhe therefore goes up on land to ſcratch away the ſand, and ſet them at liberty. They ſoon avail themſelves of their liberty; a part run unguided to the water; and another part aſcend the back of the female, and are carried thither in greater ſafety. But the moment they arrive at the water, all natural connection ceaſes: when the female has introduced her young to their natural element, ſhe and the male become among the number of their moſt formidable enemies, and devour as many of them as they can. The whole brood ſcatters into different parts at the bottom; and by far the greateſt number are deſtroyed.

It is not the Crocodile alone, however, that is thus found to thin their numbers; the eggs of this animal are not only a delicious feaſt to the ſavage, but are eagerly ſought after by every beaſt and bird of prey. The ichneumon was erected into a deity among the ancients, for its ſucceſs in deſtroying the eggs of theſe monſters: at preſent that ſpecies of the vulture called the gallinazo is their moſt prevailing enemy. All along the banks of great rivers, for thouſands of miles, the Crocodile is ſeen to propagate in numbers that would ſoon over-run the earth, but for the vulture, which ſeems appointed by Providence to abridge its fecundity. Theſe birds are ever found in greateſt numbers where the Crocodile is moſt numerous; and hiding themſelves within the thick branches of the trees that ſhade the banks of the river, they ſilently watch the female, and permit her to lay all her eggs without interruption. When ſhe has retired, they encourage each other with cries to the ſpoil; and flocking together upon the hidden treaſure, tear up the eggs, and devour them in leſs time than they were depoſited. They are equally diligent in attending the female while ſhe is carrying her young to the water; for if any one of them happens to drop by the way, it is ſure to receive no mercy.

To what age the Crocodile lives we are not certainly informed; Ariſtotle ſays, it lives the age of man: but the ancients ſo much amuſed themſelves in inventing fables concerning this animal, that even truth from them is ſuſpicious. What we know for certain from the ancients is, that among the various animals that were produced to fight in the amphitheatre at Rome, the combat of the Crocodile was not wanting. Marcus Scaurus produced them living in his unrivalled exhibitions; and the Romans conſidered him as the beſt citizen, becauſe he furniſhed them with the moſt expenſive entertainments,

NATURAL HISTORY of the SALAMANDER.

AS the ancients ſaw the earth, the air, and water inhabited, fancy was ſet to work to form an inhabitant of fire; and thus to people every part of nature. They have deſcribed a lizard that is bred from heat, that lives in the flames, and feeds upon fire as its proper nouriſhment. It is univerſally known, however, that there is no ſuch animal exiſting.

The modern Salamander, as already obſerved, is an animal of the lizard kind, and a large tribe is comprehended under this name. Seven ſorts of Salamanders have been deſcribed by Seba; and if we ſuppoſe the tail of a lizard applied to the body of a frog, we ſhall form a tolerable idea of their figure. The common lizard is long, ſmall, and taper; the Salamander, like the frog, has its eyes towards the back of the head; but it differs more from the lizard tribe in its nature and conformation than in its figure. The Salamander is an heavy torpid animal; the lizard tribe are active, reſtleſs, and ever in motion.

The Salamander, and many others of the lizard tribe, are ſaid to have venom; but it is certain that all with which we are acquainted in this country, are perfectly harmleſs; and it is equally true, that, for a long time, till our prejudices were removed, we conſidered not only the newt, but the ſnake and the blind-worm, as fraught with the moſt deſtructive poiſon. At preſent we have got over theſe prejudices; and, it is probable, that, if other nations made the ſame efforts for information, it would be found, that the malignity of moſt, if not all, of the lizard tribe, was only in the imagination.

The whole tribe of Salamanders, from the moron to the gekko, are ſaid to be venomous to the laſt degree; yet, when experiments have been tried, no arts, no provocations, could excite theſe animals to the rage of biting. They ſeem timid and inoffenſive, feeding only upon worms and inſects; quite deſtitute of fangs, like the viper; their teeth are ſo very ſmall, that they are hardly able to inflict a wound. But as the teeth are thus incapable of offending, the people of the countries where they are found have recourſe to a venomous ſlaver, which, they ſuppoſe, iſſues from the animal's mouth; they alſo tell us of a venom iſſuing from the claws: even Linnæus ſeems to acknowledge the fact; but thinks it a probable ſuppoſition, that this venom may proceed from their urine.

The gekko is the moſt notorious for its powers of miſchief: yet, we are told by thoſe who load it with that calumny, that it is very friendly to man, and though ſupplied with the moſt deadly virulence, is yet never known to bite. It would be abſurd in us, without experience, to pronounce upon the noxious or inoffenſive qualities of animals: yet it is moſt probable, from an inſpection of the teeth of lizards, and from their inoffenſive qualities in Europe, that the gekko has been unjuſtly accuſed; and that its ſerpent-like figure has involved it in one common reproach with ſerpents.

The Salamander beſt known in Europe, is from eight to eleven inches long, uſually black, ſpotted with yellow; and when taken in the hand feeling extremely cold. There are ſeveral kinds. Our black water newt is reckoned among the number. The idle report of its being inconſumable in fire, has cauſed many of theſe poor animals to be burnt; but we cannot ſay as philoſophical martyrs; ſince ſcarce any philoſopher could think it neceſſary to make the experiment. When thrown into the fire, the animal is ſeen to burſt with the heat of its ſituation, and to eject its fluids. We are gravely told, in the Philoſophical Tranſactions, that this

is a method the animal takes to extinguiſh the flames.

The Salamander differs very little internally from other animals of the lizard kind. It is furniſhed with lungs that ſometimes ſerve for the offices of breathing; with a heart that has its communications open, ſo that the animal cannot eaſily be drowned. But what deſerves particular notice is the manner of this animal's bringing forth its young alive. "The Salamander begins to ſhow itſelf in ſpring, and chiefly during heavy rains. When the warm weather returns, it diſappears; and never leaves its hole, during either great heats or ſevere colds, both which it equally fears. When taken in the hand, it appears like a lump of ice; it conſequently loves the ſhade, and is found at the feet of old trees, ſurrounded with bruſh-wood at the bottom. It is fond of running along new-ploughed grounds; probably to ſeek for worms, which are its uſual food. One of theſe," ſays our author, "I took alive ſome years ago in a ditch that had been lately made. I laid it at the foot of the ſtairs upon coming home, and there it diſgorged from the throat a *worm* three inches long, that lived for an hour after, though wounded as I ſuppoſe by the teeth of the animal. I afterwards cut up another of theſe lizards, and ſaw not leſs than fifty young ones, reſembling the parent, come from its womb, all alive, and actively running about the room." It were to be wiſhed the author had uſed another word beſide that of *worm*; as we now are in doubt whether he means a real worm, or a young animal of the lizard ſpecies: had he been more explicit, and had it appeared that it was a real young lizard, which we take to be his meaning, we might here ſee a wonder of nature, brought to the proof which many have aſſerted, and many have denied. We mean the refuge which the young of the ſhark, the lizard, and the viper kinds, are ſaid to take, by running down the throat of the parent, and there finding a temporary ſecurity. The fact, indeed, ſeems a little extraordinary; and yet it is ſo frequently atteſted by ſome, and even believed by others, whoſe authority is reſpectable, among the number of whom we find Mr. Pennant, that the argument of ſtrangeneſs muſt give way to the weight of authority.

There is no doubt, however, of the animal's being viviparous, and producing above fifty at a time. They are produced in full perfection, and quickly leave the parent to ſhift for themſelves. Theſe animals, in the lower ranks of nature, want ſcarce any help when excluded; they ſoon complete the little circle of their education; and in a day or two are capable of practiſing all the arts of ſubſiſtance and evaſion practiſed by their kind.

They are all amphibious, or at leaſt are found capable of ſubſiſting in either element, when placed there; if thoſe taken from land are put into water, they continue there in ſeeming health; and, on the contrary, thoſe taken from the water will live upon land. In water, however, they exhibit a greater variety in their appearance; and what is equally wonderful with the reſt of their hiſtory, during the whole ſpring and ſummer this water lizard changes its ſkin every fourth or fifth day; and during the winter every fifteen days. This operation they perform by means of the mouth and the claws; and it ſeems a work of no ſmall difficulty and pain. The caſt ſkins are frequently ſeen floating on the ſurface of the water: they are ſometimes ſeen alſo with part of their old ſkin ſtill ſticking to one of their limbs, which they have not been able to get rid of. This alſo often corrupts, and the leg drops off; but the animal does not ſeem to feel the want of it, for the loſs of a limb to all the lizard kind is but a trifling calamity. They can live ſeveral hours even after the loſs of their head: and for ſome time, under diſſection, all the parts of this animal ſeem to retain life; but the tail is the part that longeſt retains its motion. Salt ſeems to be much more efficacious in deſtroying theſe animals, than the knife; for, upon being ſprinkled with it, the whole body emits a viſcous liquor, and the lizard dies in a few minutes, in great agonies.

The lizard kind are alſo tenacious of life in another reſpect, and the Salamander among the number. They ſuſtain the want of food in a ſurpriſing manner. One of them, brought from the Indies, lived nine months, without any other food than what it received from licking a piece of earth on which it was brought over: another was kept by Seba in an empty vial for ſix months, without any nouriſhment; and Redi talks of a large one, brought from Africa, that lived eight months without taking any nouriſhment whatever. Indeed, as many of this kind, both Salamanders and lizards, are torpid, or nearly ſo, during the winter, the loſs of their appetite for ſo long a time is the leſs ſurpriſing.

Natural History of the SCALY LIZARD.

THE length of this animal, from the noſe to the hind legs, is about three inches; and from thence to the end of the tail, three inches and three quarters. It ha a black liſt along the back, and a brown one on each ſide; beneath that it has a broad black one. The belly is yellow, and the ſcales large and even. The ſcales on the back are ſmall, varied with black and brown. The legs and feet are duſky, each foot having five toes furniſhed with claws. This ſpecies is extremely nimble: in hot weather it is frequently ſeen baſking on the ſides of dry banks or old trees; but, on being obſerved, it immediately retreats to its hole. The food of this and every other ſpecies of Engliſh Lizards, is inſects. All the Lizards of this country are perfectly harmleſs; it is their form only that diſguſts us, and has occaſioned them to be repreſented in an unfavourable light.

The WARTY LIZARD.

This animal is ſix inches and an half in length, of which the tail is about three inches and a quarter. The iris of the eye is yellow. The head and part of the back is flat, of a dark duſky colour, and covered with ſmall pimples or warts: the ſides are covered with white warts: the belly is of a bright yellow, ſpotted with black. The fore-feet are divided into four toes; the hind feet with five; they are all duſky, ſpotted with yellow, and without nails. The pace of this Lizard is ſlow and crawling.

The GREEN LIZARD.

The Green Lizard is ſo called from its colour, and it is larger than the common ſort. It delights in warm countries, and is very common in Italy. They are found on trees in the ſummer-time, where they make a noiſe like the croaking of frogs.

The BROWN LIZARD.

This ſpecies is about three inches long; the body is ſlender; the tail long, ſmall and taper. The upper part of the body is of a pale brown, marked on each ſide of the back with a narrow black line, extending to the end of the tail. The belly is of a pale yellow, marked with ſmall duſky ſpots.

There is a ſpecies called the ſnake-ſhaped Lizard, which ſeems to be of that kind which connects the ſerpent and Lizard genus, having a long ſlender body, and very ſmall legs.

The

The TARANTALA LIZARD.

This animal is very common near Naples and Rome: it has a rough ſkin of an aſh colour, and is thicker and more fleſhy than other Lizards. It uſually haunts the ruins of old buildings, and walls; and has a very diſagreeable aſpect, ſtriking the beholders with a kind of dread. When Mr. Ray firſt ſaw one, he ſays he ſhuddered as it were by inſtinct. It is however ſaid, that it is perfectly harmleſs, and the horror with which it affects mankind, is principally owing to its uglineſs and filthy aſpect.

NATURAL HISTORY of the TARAQUINA.

THIS animal, which is a Braſilian Lizard, is about a foot in length. The body is round, and covered with triangular aſh coloured ſcales. It delights in gardens, and to be near houſes: when it ſees any thing, it nods the head in a very ſurpriſing manner; and runs nimbly from place to place, making ſtrange motions with its body. It is ſaid, that when this animal ſees a man ſleeping, and a ſerpent, or any other venomous animal coming near him, it never fails to wake him that he may avoid the danger.

The Ameiva, which is a Lizard of South America, is in all reſpects like the former, except that it has a forked tail.

NATURAL HISTORY of the IGUANA.

THE length of this animal is about five feet, and the body is about as thick as a man's thigh: the ſkin is covered with ſmall ſcales, like thoſe of a ſerpent; and the back is furniſhed with a row of prickles, that ſtand up, like the teeth of a ſaw: the eyes ſeem to be but half opened, except when the animal is angry, and then they appear large and ſparkling: both the jaws are full of very ſharp teeth, and the bite is dangerous though not venomous, for it never quits its hold till it is killed. The male has a ſkin hanging under his throat, which reaches down to his breaſt; and, when diſpleaſed, he puffs it up like a bladder: he is one third larger and ſtronger than the female; tho' the ſtrength of either avails them little towards their defence. The males are aſh coloured, and the females green.

The fleſh of the Iguana may be conſidered as the greateſt delicacy of Africa and America; and the ſportſmen of thoſe climates go out to hunt it as we do in purſuit of the pheaſant or the hare. In the beginning of the ſeaſon, when the great floods of the tropical climates are paſt away, and vegetation ſtarts into univerſal verdure, the ſportſmen are ſeen, with a nooſe and a ſtick, wandering along the ſides of the rivers, to take the Iguana. This animal, though apparently formed for combat, is the moſt harmleſs creature of all the foreſt; it lives among the trees, or ſports in the water, without ever offering to offend; there, having fed upon the flowers of the mahot, and the leaves of the mapou, that grow along the banks of the ſtreams, it repoſes upon the branches of the trees that hang over the water. Upon land the animal is ſwift of foot; but when once in poſſeſſion of a tree, it ſeems conſcious of the ſecurity of its ſituation, and never offers to ſtir. There the ſportſman eaſily finds it, and as eaſily faſtens his nooſe round its neck: if the head be placed in ſuch a manner that the nooſe cannot readily be faſtened, by hitting the animal a blow on the noſe with the ſtick, it lifts the head, and offers it in ſome meaſure to the nooſe. In this manner, and alſo by the tail, the Iguana is dragged from the trees, and killed by repeated blows on the head.

NATURAL HISTORY of the CAMELEON.

THIS little animal, like the crocodile, proceeds from an egg; and it alſo nearly reſembles that formidable creature in form; but it differs conſiderably in its ſize and its appetites; it is not above eleven inches long, and delights to ſit upon trees, being afraid of ſerpents, from which it is unable to eſcape on the ground. The head of a large Cameleon is almoſt two inches long; and from thence to the beginning of the tail, four and an half; the tail is five inches long, and the feet two and an half; the thickneſs of the body is different at different times; for ſometimes, from the back to the belly, it is two inches, and ſometimes but one; for it can blow itſelf up, and contract itſelf, at pleaſure. This ſwelling and contraction is not only of the back and belly, but of the legs and tail.

Theſe tumours do not proceed from a dilatation of the breaſt in breathing, which riſes and falls by turns, but are very irregular, and ſeem adopted merely from caprice. The Cameleon is often ſeen, as it were, blown up for two hours together; and then it continues growing leſs and leſs inſenſibly; for the dilatation is always quicker and more viſible than the contraction. In the contracted ſtate, the animal appears extremely lean; the ſpine of the back ſeems ſharp, and all the ribs may be numbered, the tendons of the legs and arms may alſo be ſeen very diſtinctly.

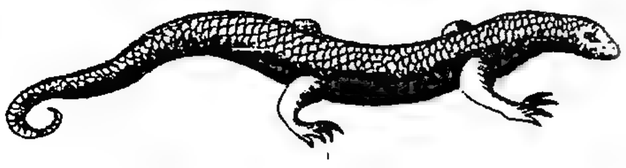
This method of puffing itſelf up is ſimilar to that in pigeons, whoſe crops are ſometimes greatly diſtended with air. The Cameleon has a power of driving the air it breathes over every part of the body, but it only gets between the ſkin and the muſcles; for the muſcles themſelves are never ſwollen. The ſkin is very cold to the touch: and tho' the animal ſeems ſo lean, there is no feeling the beating of the heart. The ſurface of the ſkin is unequal, and has a grain not unlike ſhagreen, but very ſoft; becauſe each eminence is as ſmooth as if it were poliſhed. Some of theſe little protuberances are as large as a pin's head, on the arms, legs, belly and tail; but on the ſhoulders and head they are of an oval figure, and a little larger: thoſe under the throat are ranged in the form of a chaplet, from the lower lip to the breaſt. The colour of all theſe eminences, when the Cameleon is at reſt in a ſhady place, is of a bluiſh grey; and the ſpaces between are of a pale red and yellow.

But the wonderful part of this animal's hiſtory, is when it is removed into the ſun. At firſt it appears to ſuffer no change of colour, its greyiſh ſpots ſtill continuing the ſame; but the whole ſurface ſoon appears to imbibe the rays of light; and the ſimple colouring of the body changes into a variety of beautiful hues. Wherever the light comes upon the body, it is of a tawny brown; but that part of the ſkin on which the ſun does not ſhine, changes into ſeveral brighter colours, pale yellow, or vivid crimſon; which form ſpots of half the ſize of a man's finger; ſome of theſe deſcend from the ſpine half way down the back; and others appear on the ſides, arms, and tail. When the ſun ceaſes to ſhine, the original grey colour returns by degrees, and covers all the body. Sometimes the animal becomes all over ſpotted with brown ſpots, of a greeniſh caſt. When wrapped up in a white linen cloth for two or three minutes, the natural colour becomes much lighter; but not quite white, as ſome authors have pretended: however, from hence it muſt not be concluded, that the Cameleon aſſumes the colour of the objects which it approaches; this

is

SERPENTS.

AMERICIMA *or Brazilian Lizard*



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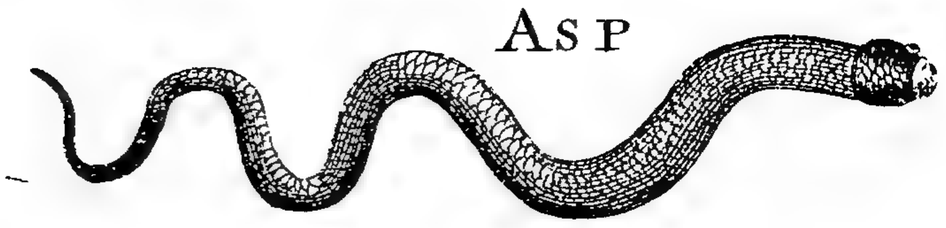

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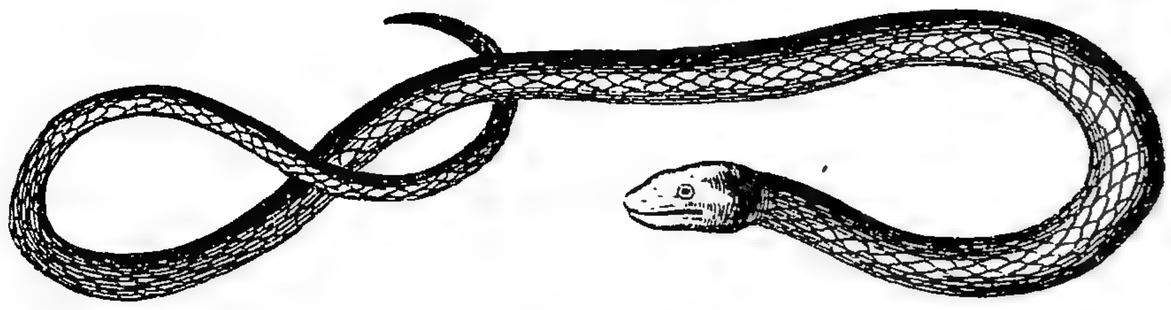
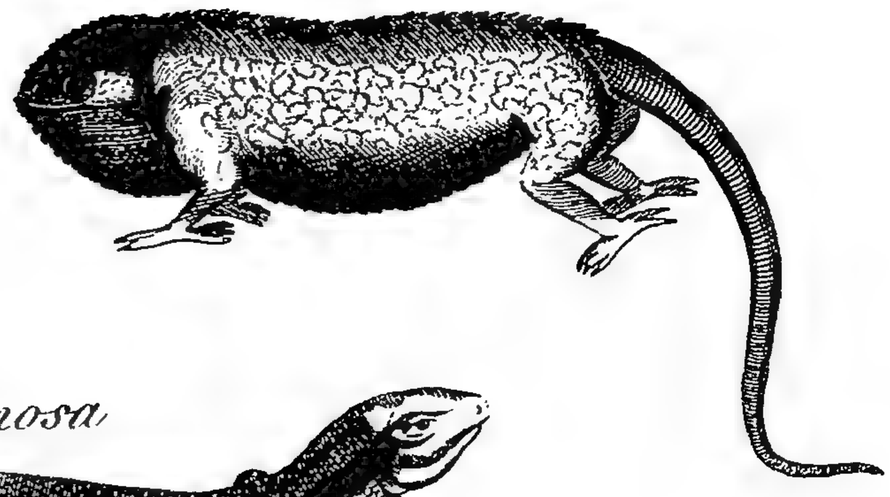


CAMELEON



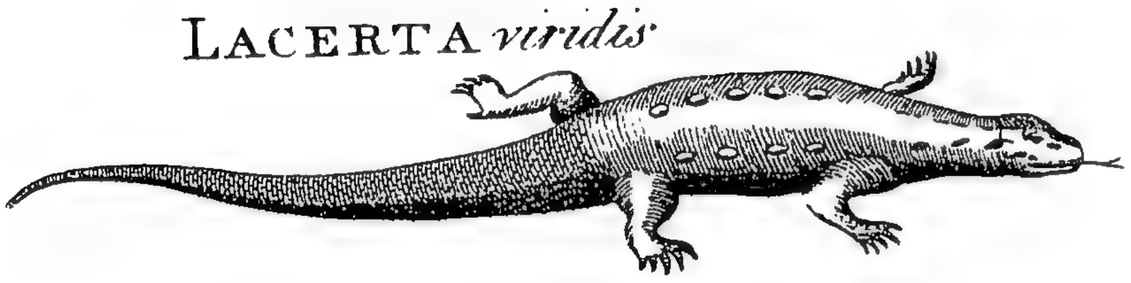
LACERTA *Squamosa*

Lacerta Palustris

LACERTA *Chalcidica or* SEPS

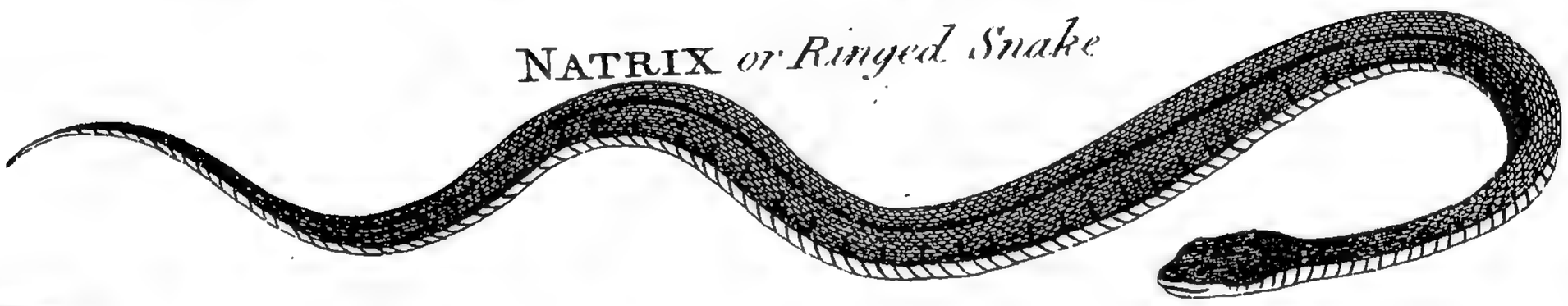
SALAMANDRA *aquatica or warty Lizard*

LACERTA *viridis*

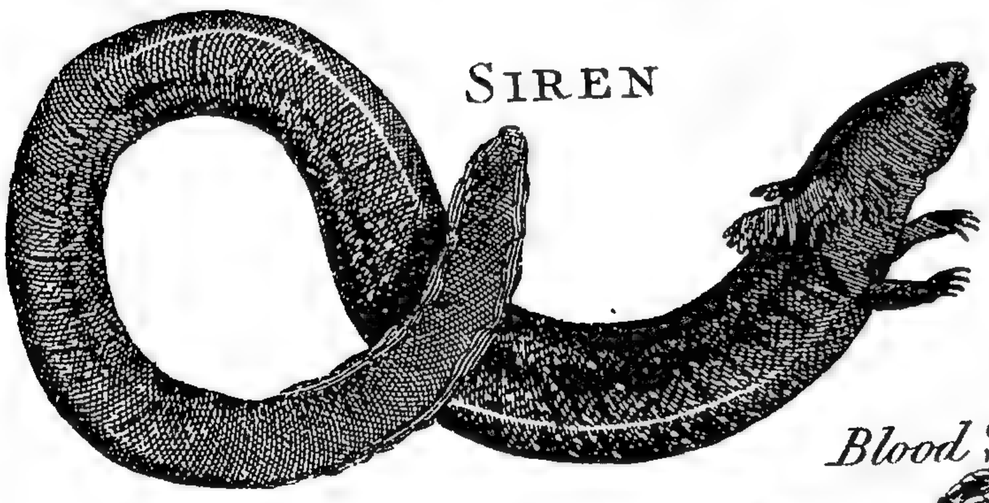


LACERTA *vulgaris or Brown Lizard*

NATRIX *or Ringed Snake*



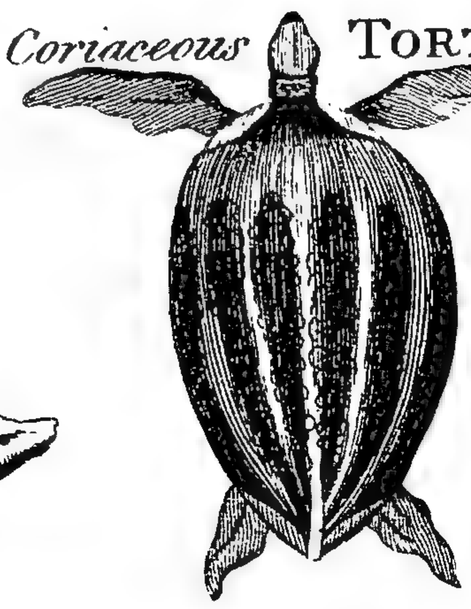
SIREN



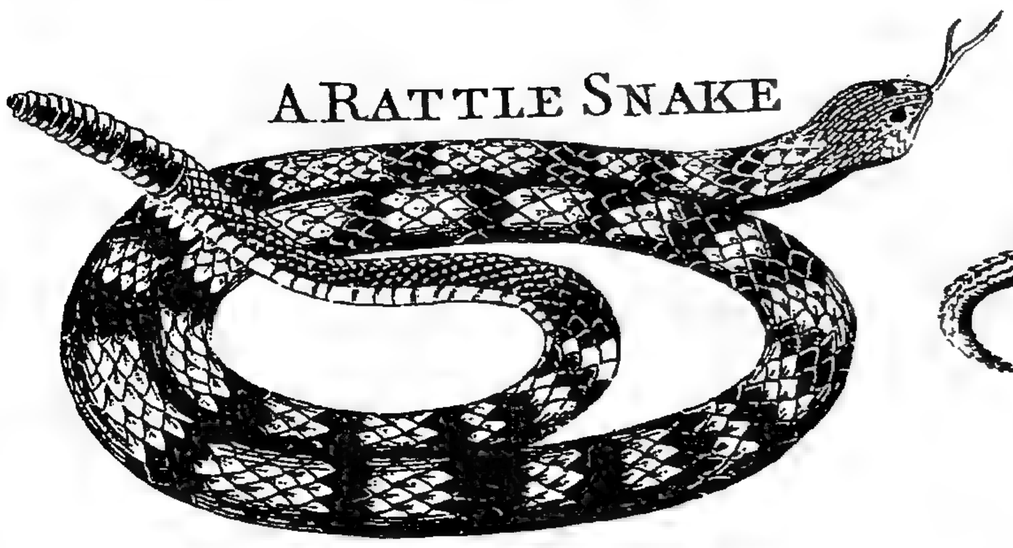
SLOW *worm or Blind worm*

Blood SNAKE *or Hæmorrhous*

Coriaceous TORTOISE

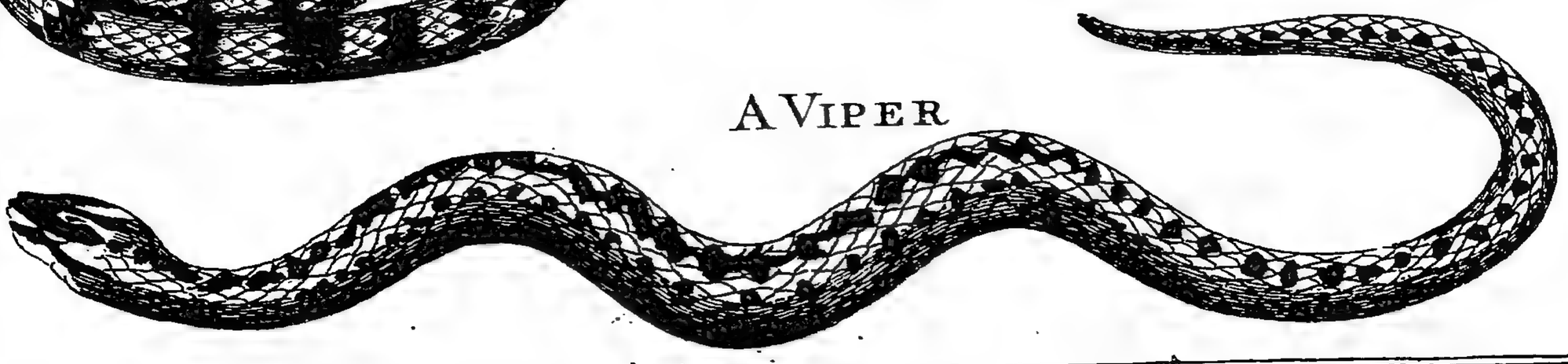


A RATTLE SNAKE



TARANTULA

A VIPER



Eastgate sculp.

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is entirely an error, and probably has taken its riſe from the continual changes it appears to undergo.

An ample deſcription of the Cameleon is given us by Le Bruyn, in his voyage to the Levant. During his abode at Smyrna, he bought ſeveral of this kind, and, to try how long they could live, kept four of them in a cage, permitting them at times to run about the houſe. The freſh ſea breeze ſeemed to give them moſt ſpirits and vivacity; they opened their mouths to take it in: he never ſaw them eat any thing, except now and then a fly, which they took half an hour to ſwallow: he obſerved their colour frequently change, three or four times ſucceſſively, without being able to find out any cauſe for ſuch alterations: their common colour he found to be grey, or rather a pale mouſe-colour; but its moſt frequent changes were into a beautiful green, ſpotted with yellow: ſometimes the animal was marked all over with dark brown; and this often changed into a lighter brown: ſome colours, however, it never aſſumed; and, contrary to what was ſaid above, he found red to be among the number.

Tho' he was particularly careful, he was unable to preſerve any of them alive above five months; and many of them died in four. When the Cameleon changes place, and attempts to deſcend from an eminence, it moves with the utmoſt precaution, advancing one leg very deliberately before the other, till ſecuring itſelf by holding whatever it can graſp by the tail. It ſeldom opens the mouth, except for freſh air; and when that is ſupplied, diſcovers its ſatisfaction by its motions, and the frequent changes of its colour. The tongue is ſometimes darted out after its prey, which is flies; and this is as long as the whole body. The eyes are remarkably little, though they ſtand out of the head: they have a ſingle eye-lid, like a cap with a hole in the middle, thro' which the ſight of the eye appears, which is of a ſhining brown; and round it there is a little circle of a gold colour: but the moſt extraordinary part of their conformation is, that the animal often moves one eye, when the other is entirely at reſt; nay, ſometimes one eye will ſeem to look directly forward, while the other looks backward; and one will look downwards, while the other looks into the air.

Natural History of the VIPER.

THIS animal differs from other ſerpents, in moving more ſlowly, in never bounding or leaping, and in bringing its young to perfection before they are excluded. The females of other ſerpents lay eggs, which are either hatched by the heat of the ſun, or in the place of the retreat.

Vipers are found in many parts of this iſland, particularly in the dry, ſtony, and chalky countries. Providence is extremely kind in not ſuffering this ſpecies to be prolific; more than ten or eleven eggs being ſeldom found in one Viper: theſe are about the ſize of a blackbird's egg, and appear as if they were chained together.

The Viper ſeldom exceeds two feet in length, though they are ſometimes found very little ſhort of three feet. The ground colour is a dirty yellow; that of the female of a deeper yellow. Its back is marked with a kind of chain of black ſpots, touching each other at the points. A little below is another row of blackiſh ſpots, and on the lower part of the ſides there is a line conſiſting of little white ſpots, and then another of black, which are larger. The head is inflated, which diſtinguiſhes it from the common ſnake. The tongue is forked; the teeth ſmall; the four canine teeth are placed two on each ſide of the upper jaw; the inſtruments of poiſon are long, crooked, and moveable; and can be raiſed and depreſſed at pleaſure: they are hollow from near the point to their baſe, and the action which gives the wound, forces the fatal juice into it, thro' the tooth.

Vipers generally caſt their ſkins twice a year, and the ſucceeding ones always appear brighter and more beautiful, than thoſe which they have quitted. Soon after this another ſkin begins to be formed; ſo that it may be ſaid always to have a double ſkin. When the ſkin is taken off, and the Viper cut into ſeveral pieces, it will remain alive for ſeveral hours, and the head is always ready to bite; nor will the bite be leſs dangerous than at another time. Vipers do not, like other ſerpents, make holes in the earth; but uſually hide themſelves under ſtones, or the ruins of old houſes. In fine weather, however, they are frequently found in tufts of graſs, and among buſhes.

This animal is ſaid not to arrive at its full growth in leſs than ſix or ſeven years; but it is capable of engendering at three.

The tongue of the Viper conſiſts of two long fleſhy round bodies, which terminate in ſharp points, and are very pliable. It is about an inch and an half in length, and its root is ſtrongly connected to the neck by two tendinous bodies, near a quarter of an inch in length. The tongue of ſome Vipers has three or four points; and, though they are often darted out, they do no injury, except that of terrifying thoſe that behold them; for they principally ſerve to catch the ſmall animals on which the Viper feeds.

We are aſſured, from good authority, that the young of the Viper, when terrified, will run down the throat of the parent, and ſeek ſhelter in its belly, in the ſame manner as the young of the oppoſſum, retire into the ventral pouch of the old one. Hence it has been imagined by ſome, that the Viper is ſo unnatural as to devour its own young.

Theſe animals, when at liberty, remain torpid throughout the winter; but when they have been confined, they have never been obſerved to take their annual repoſe.

Aretæus, ſays Dr. Mead, who has moſt accurately deſcribed the elephantiaſis, commends, as Craterus did, the eating of Vipers, inſtead of fiſh, in the ſame diſeaſes. And to this purpoſe we remember, that as Lopez, in his relations of the kingdom of Congo, in Africa, takes notice how greedily the negroes eat adders, roaſting them, and eſteeming them as the moſt delicious food; ſo Dampier, alſo, informs us, that the natives of Tonquin, in the Eaſt-Indies, treat their friends with arrack, in which ſnakes and ſcorpions have been infuſed, accounting this, not only a great cordial, but alſo, an antidote againſt the leproſy, and all other ſorts of poiſon.

The phyſicians in Italy and France, very frequently preſcribe the broth and jelly of Vipers fleſh, for much the ſame uſes, that is, to invigorate and purify the maſs of blood exhauſted with diſeaſes, or tainted with ſome vicious and obſtinate ferment.

From all this it appears, that the main efficacy of the Viperine fleſh, is, to quicken the circulation of the blood, promote its due mixture, and by this means cleanſe and ſcour the glands of thoſe ſtagnating juices, which, turning to acidity, are the origin of many, at leaſt, of thoſe troubleſome diſtempers in the ſurface of the body, which go under the names of ſcrophulous, and leprous.

Theſe good effects are owing to that penetrating, ſtrong ſalt, with which the ſubſtance of theſe creatures, in a very great proportion, abounds; and the reaſon of this is from the food they live on, which are lizards, moles, &c. whoſe nature every one knows to be ſuch as muſt neceſſarily, when they are diſſolved

diſſolved in the ſtomach, ſupply the blood with a great quantity of active and volatile parts. And herein lies the difference between the fleſh of Vipers, and that of other innocent ſerpents, which, feeding upon graſs and herbs, do not recommend themſelves to us by any of thoſe properties, which are in ſo eminent a degree found in the former.

Whoever reflects on what has been ſaid on this head, will very readily acknowledge, that our phyſicians deal too cautiouſly or ſparingly with a remedy, which may be applied to very good purpoſes, when they preſcribe a few grains of the powder of dried Vipers, or make up a ſmall quantity of their fleſh in troches; whereas, if ſervice be really to be done this way, the patient ought to eat frequently of Viper jelly, or broth; or rather, as the ancient manner was, to boil Vipers, and eat them like fiſh; if this food will not go down, (though really very good and delicious fare) to make uſe at leaſt of wine, in which Vipers have for a long time been infuſed, by which we know a very obſtinate lepra has been removed; or, laſtly, in ſome caſes, eſpecially where wine is not convenient, to take good quantities of their volatile ſalt, in which alone the virtue of the before-named medicines principally reſide.

It is worthy our obſervation, continues Dr. Mead, that the Viper can move the jaw-bones on one ſide, without moving thoſe of the other; for they are not joined together at the extremes, as in other animals; which contrivance is very beneficial to it in the ſwallowing its prey; for while the teeth on one ſide ſtand unmoved, and fixed in the fleſh to hold it, thoſe on the other ſide are brought forward, to draw it in farther; then they keep it faſt till the former jaws advance again in their turn: thus they act ſucceſſively, and force the animal entire into the oeſophagus, whoſe muſcular fibres are very weak, and can help but little in the buſineſs.

The ſymptoms which follow upon the bite of a Viper, when it faſtens either one or both its greater teeth, in any part of the body, are an acute pain in the place wounded, with a ſwelling, at firſt red, but afterwards livid, which, by degrees, ſpreads farther to the neighbouring parts with great faintneſs, and a quick, though low, and ſometimes interrupted pulſe, great ſickneſs at the ſtomach, with bilious convulſive vomitings, cold ſweats, and ſometimes pains about the navel; and if the cure be not ſpeedy, death itſelf, unleſs the ſtrength of nature proves ſufficient to overcome theſe diſorders; and though it does, the ſwelling ſtill continues inflamed for ſome time; nay, in ſome caſes, more conſiderably upon the abating of the other ſymptoms, than at the beginning; and often, from the ſmall wound, runs a ſanious liquor, and little puſtules are raiſed about it; the colour of the whole ſkin is changed yellow, as if the patient had the jaundice.

Theſe miſchiefs, although different climates, ſeaſon of the year more or leſs hot, the greater or leſſer rage of the Viper, the beaſt itſelf, of a larger or ſmaller ſize, and, conſequently, able to communicate more or leſs venom, and the like circumſtances, may variouſly heighten or abate them, yet uſually diſcover themſelves much after the ſame manner in all; unleſs the bite happen not to be accompanied with the effuſion of that liquor, which is the main inſtrument and cauſe of this violent and ſhocking diſturbance.

But before we proceed to enquire into the nature and manner of acting of this juice, it may be proper to take notice, that this is not made on purpoſe to be deadly and deſtructive to mankind; but that the true deſign of it is (though authors have not regarded it) to perform an office and ſervice of ſo great moment to the preſervation of the individual, that without it this creature could not ſubſiſt.

For Vipers live principally upon lizards, frogs, toads, mice, moles, and the like animals, which they do not chew, but ſwallow down whole, and they lie in the ſtomach; or if that be not large enough to receive them, partly in that, and partly in the oeſophagus, which is membranous, and capable of great diſtention, till by the ſaliva juices of thoſe parts, together with the help of the fibres of the ſtomach, and the contraction of the muſcles of the abdomen, they are gradually diſſolved into a fluid ſubſtance, fit for the nouriſhment of their bodies, which is the work of many days: this is one reaſon why theſe creatures can live ſo long without taking any freſh food, which they have been known to do three or four months; another is, that their blood is a groſſer and more viſcid fluid than that of moſt other animals; ſo that there is but a very little expence of it, by tranſpiration, and, conſequently, leſs need of recruit; this not only microſcopes diſcover, but reaſon teaches; becauſe there is but very little muſcular force in the ſtomach to comminute the food, and make a chyle of fine parts; and therefore the blood muſt accordingly be of a tough and clammy conſiſtence. Beſides, the heart of a Viper has properly but one ventrical, and the circulation of the blood is performed after the ſame manner as it is in a frog and tortoiſe, in which not above one-third of it paſſes through the lungs; on which account its communication in them by the air is proportionably leſſer than in other animals. Now ſuch a manner of feeding as this, neceſſarily requires that the prey ſhould, upon the firſt catching, be immediately killed, otherwiſe it were by no means fit to be let into the ſtomach; for we are not to think, that the force of this part would be alone ſufficient to deſtroy it, the ſubtlety of a living creature (beſides the conſideration of the weakneſs of the fibres) being in a great meaſure able to elude that, as indeed we every day find live animals in the ſtomachs of others; and therefore to do this, is the proper uſe both of the teeth and their poiſon; for which being deſigned and adapted, it is no wonder if the Viper, the ſame way by which it deſtroys its prey, proves ſometimes miſchievous to any other creature beſides, when it happens to be enraged, or by any provocation ſtirred up to bite.

It is worth the while, ſays Dr. Mead, in the next place, to conſider the cure of this miſchief, which, without all doubt, ought to be by ſuch external management of the wound as may immediately deſtroy the infuſed venom.

Boyle experienced an hot iron, held as near the place as the patient could poſſibly endure it, very effectual to this purpoſe: but the ſame method did not anſwer expectation, in the famous caſe related by Charas.

An extraordinary virtue againſt this and other venomous bites, is aſcribed to the ſnake-ſtones brought from the Eaſt-Indies, one of which is to be preſently applied to the part, and let ſtick till it drop off: theſe are ſaid to be taken out of the head of the ſerpent, called by the Portugueſe, cobra de capello, and to ſuck the poiſon out of the wound. Redi made trials with ſeveral of them, but found no ſervice from any: yet Baglivi tells us of a terrible bite of a ſcorpion cured this way. Monſieur Charas's pigeons all died, though theſe were immediately clapped on, and ſtuck cloſe to the wound: but Havers ſaw a good effect of one upon a dog, who, though ſeverely bitten, ſuffered no harm; nor any farther mark of the poiſon, than a livid circle round the place.

In plain truth, as theſe celebrated ſtones do not ſeem to be what it is pretended they are, but rather factitious bodies, compounded, perhaps, of calcined bones, and ſome teſtaceous matters mixt together; ſo, by reaſon of their ſpongy and porous texture, they very readily adhere to any moiſtened part of

the

the flesh, and imbibe whatsoever humidity they meet with: this their quality any one may experience, by holding one of them to the roof of his mouth: and it is upon this score that, when put into water, bubbles are raised by the air in their interstices, which some have too fondly thought to be the effects of their throwing out the venom they had sucked in.

Their make being thus, some part at least of the poisonous juice may easily be drawn out of the wound, by such an application; and yet so much of it may sometimes happen to remain in the flesh, as may make the bite however to prove mortal. And thus it fared with a pigeon, to the thigh of which, first bitten by a Viper, one of the stones was applied; for though it stuck fast to the wound, and thus saved the life for about four hours (whereas others usually died in about half an hour), yet, after this, the mortification of the part prevailed to that degree as to become fatal to the tender creature.

But our Viper catchers have a remedy far beyond all these, in which they place so great confidence, as to be no more afraid of a bite than of a common puncture, immediately curing themselves by the application of their specific.

This, though they keep as a great secret, we have, however, upon strict inquiry, found out to be no other than the axungia viperina presently rubbed into the wound. And to convince ourselves of its good effects, a Viper was enraged to bite a young dog in the nose; both the teeth were struck deep in; he howled bitterly, and the part began to swell. We diligently applied some of the axungia that was ready at hand, and he was very well the next day.

But because some gentlemen who saw this experiment were apt to impute the cure rather to the dog's spittle (he licking the wound) than to the virtue of the fat, we caused him to be bit again in the tongue, forbearing the use of our remedy, and he died within four or five hours.

At another time a like trial was made with the same success.

As this axungia consists of clammy and viscid parts, which are withal more penetrating and active than most other oily substances, so these, without all doubt, involve, and as it were, sheath the volatile salts of the venomous liquor, and thus prevent their shooting out into those crystalline spicula, which we have observed to be the main instruments of that deadly mischief which attends the bite.

By this means it comes to pass, that this cure, if rightly managed, is so easy and certain, as not to need the help of any internal medicines to forward it; but these however must take place where, through want of the other, the poison is spread farther, and has tainted the whole mass of blood.

Nor yet is it necessary, even in this case, to fatigue the patient with a farago of theriacas and antidotes; for the volatile salt of Vipers is alone sufficient to do the work, if given in just quantities, and duly repeated; provided moderate sweats be encouraged in bed: thus it succeeded with Monsieur Charas, and in some others we could relate; in one of which the mischief had gone so far as to induce an universal icterus.

We must remark, that since Dr. Mead wrote the treatise of poisons, from which some of these particulars relative to the Viper are extracted, a man and his wife, who made it their business to catch Vipers, came from Bath to Oxford, and from thence to London; and, after having shewn a great number of experiments, with respect to the bite of this animal, at last discovered an effectual remedy, which consists in nothing more, than chafing the part wounded with olive oil, before the fire; and, if the case should be extremely bad, wrapping the entire affected limb in a cerate, made of white-lead, and the same oil.

We must further observe, that as the viperine poison acts by inducing a coagulation of the blood, which spreads gradually from the wounded part to the heart, of which we have seen an hundred inconteſtible instances; and as rubbing in the oil, prevents the coagulation, and resolves the blood already coagulated; hence, perhaps, we may account for the efficacy of unctions, so much practised by the antient physicians, especially those of the methodic sect.

The JAVAN VIPER.

This animal is covered with scales of a sea green colour, and surrounded with stripes of a dark tawny; running transversely round the body, from the head to the tail. The head is defended with large reddish scales, with two transverse stripes over the eyes. It has a red circle round the neck, and the scales on the belly are of a bright yellow, bordered on the sides with a small black line.

The VIPER of CEYLON.

It has two small eyes seated over the nostrils, and the appearance of two others, but they are only two whitish spots over the jaws, that resemble eyes. The nose is covered with large black scales, which are adorned with an undulated black and red streak. The belly is of a bright yellow, spotted with red, and furnished with whitish scales.

NATURAL HISTORY of the AMMODYTES of CEYLON.

THIS is a very large and dangerous serpent, and its mouth is furnished with a great number of sharp teeth. The eyes are large and sparkling, and on the forehead are small round scales of various colours; some of which are yellow, others red, and others of a mixture of red and black: the body, above and below, is of a whitish ash colour; and on the back are angular spots, variegated with white and brown. The scales on the upper part of the body are placed like net-work, with large meshes; and the tail is spotted with brown, ending in a bony point.

NATURAL HISTORY of the GERENDA.

THIS serpent inhabits the East Indies, where divine honours are paid to it. The skin is finely spotted, and covered with very thin scales of a yellowish ash colour, and encircled with red bands, which appear like ribbands. The head is oblong, resembling that of a hound, and is of a pale ash colour: the eyes are lively and sparkling; the teeth small and slender; and the nostrils large: the transverse scales on the belly are of a yellowish ash colour, and the small scales of a bright ash colour, spotted in the middle with a deep red. This serpent generally lies folded up. It is held in the highest veneration in Calicut and Japan, but the inhabitants of Malabar are greatly afraid of it.

NATURAL HISTORY of the GIBOYA.

THIS is the largest of all the Brazilian serpents: Leguat informs us, he has seen one fifty feet in length; and we have the concurrent testimony of missionaries and historians as a further proof. The largest of this kind that has been brought into Eu-

rope did not exceed thirty-ſix feet in length. The moſt uſual length, however, of this animal, is about twenty feet, and the thickneſs in proportion. The teeth are very ſmall in proportion to the body, and this ſerpent is without venom. It lies in wait for wild animals near the paths, and when it throws itſelf upon one of them, it winds about it ſo cloſely, and with ſo much ſtrength, that it breaks all its bones; then moiſtening the whole body over with its ſlaver, it renders it fit for ſwallowing whole.

NATURAL HISTORY of the BOIGUACU.

THIS ſerpent is the next in magnitude to the giboya, and has often been ſeen to ſwallow a goat whole. It is thickeſt in the middle of the body, and grows ſhorter and ſmaller towards the head and the tail. A chain of ſmall black ſpots runs along the middle of the back, and extend the whole length of the animal; on each ſide there are large round black ſpots, at ſome diſtance from each other, which are white in the centre. Between theſe, near the belly, are two rows of ſmaller black ſpots, which run parallel to the back. In each jaw it has a double row of ſharp teeth: the head is broad, and there are two prominences over the eyes. This ſerpent has two claws, reſembling thoſe of birds, near the extremity of the tail. It is obſerved by Piſo, that theſe ſerpents lie hid in the thickets, from whence they ſally out unawares, and raiſing themſelves upright on their tails, will attack both men and beaſts. When exaſperated, they make a loud hiſſing noiſe, and ſometimes dart from the trees upon travellers, and twiſt themſelves ſo cloſely round their bodies, as to diſpatch them in a very few minutes. Condaminel, however, makes no mention of this, but he affirms that their bite is not dangerous; for though the teeth are ſo large as to create terror in the mind of the beholder, their bite is not attended with any other conſequence, than what may proceed from an ordinary wound. This ſerpent is called *Cobra de Veado* by the Portugueſe.

NATURAL HISTORY of the AMPHISBÆNA, or DOUBLE-HEADED SERPENT.

THIS animal is remarkable for moving along with either the head or the tail foremoſt, as the Greek name imports: many authors have therefore affirmed that this ſerpent has two heads; which cannot poſſibly be true, there being no ſuch animal in nature. It is probable that this error took its riſe from the thickneſs of its tail; for this ſerpent is equally thick at each end, and the colour of the ſkin is like that of the earth. It is rough, hard, and variouſly ſpotted. It is an inhabitant of Lybia and the iſland of Lemnos.

NATURAL HISTORY of the DEPONA.

THIS is a very large ſerpent, and is a native of Mexico. The head and jaws are very large: the mouth is armed with cutting crooked teeth. There is a broad ſcaly border round the mouth; and the eyes are ſo large as to give it a very terrible aſpect. The forehead is covered with large ſcales, on which others, which are ſmaller, are curiouſly ranged. Each ſide of the belly is marbled with large ſquare ſpots, of a cheſnut colour, in the middle of which is a round yellow ſpot. This ſerpent avoids the ſight of man, and therefore cannot do much injury.

NATURAL HISTORY of the RATTLE-SNAKE.

THIS ſerpent is bred only in America: the uſual length is from four to five feet, but they are ſometimes ſeen ſix feet in length, and as thick as a man's leg. It reſembles the viper in many particulars: like that animal, it has a large head, and a ſmall neck: it is of a duſky colour, and is furniſhed with fangs capable of inflicting the moſt terrible wounds. It has a large ſcale, which hangs like a pent-houſe over each eye. The Rattle-Snake is of an orange, tawny, and blackiſh colour on the back; and of an aſh colour on the belly. The male may be readily diſtinguiſhed from the female, by a black velvet ſpot on the head, and by the head being ſmaller and longer. But what principally diſtinguiſhes this ſerpent is the rattle, an inſtrument lodged in its tail, by which it makes ſuch a loud rattling noiſe when it moves, that its approach may be known, and the danger avoided. This rattle is compoſod of ſeveral thin hard hollow bones, linked to each other, and rattling upon the ſlighteſt motion.

Some have aſſerted that this ſerpent acquires an additional bone every year; from whence its age may be preciſely known: it is certain, however, that ſnakes of only a year or two old have no rattles at all, but ſome old ones have been found with twelve or thirteen joints.

The certain death which accrues from the terrible bite of this creature, makes a ſolitude wherever it is heard. It moves along with majeſtic rapidity; but never unprovoked attacks any thing but its prey; but when accidentally trod upon, or purſued for its deſtruction, it makes a moſt dreadful and deſperate defence. It erects the tail, throws back the head, and inſtantly inflicts its wound: then parts, and inflicts a ſecond wound; after which, ſome travellers aſſure us, that the animal becomes torpid and inactive, and never even attempts to make its eſcape.

The very inſtant the puncture is made, it is more painful than the ſting of a bee, and this pain grows every moment more excruciating and dangerous: the limb ſwells; the venom reaches the head, which ſwells to an enormous ſize; the eyes are red and fiery; the heart beats quick; the pain becomes inſupportable, and ſome expire under it in five or ſix hours: thoſe of ſtrong conſtitutions may endure the agony a few hours longer, and at laſt ſink under a general mortification.

A gentleman in Virginia trod accidentally upon a Rattle-Snake, which had been lurking in a ſtony place: the enraged animal reared up, bit his hand, and ſhook its rattles. The gentleman, unwilling to die unrevenged, killed the ſnake, and carrying it home in his hand, threw it on the ground before his family, crying out, "I am killed, and there is my murderer!" His arm, which was beginning to ſwell, was immediately tied up near the ſhoulder, the wound was anointed with oil, and every means employed to ſtop the infection. His arm, below the ligature, appeared of ſeveral colours; all the muſcles were in motion; a fever enſued; after that the loſs of his hair, giddineſs, drought, weakneſs, and nervous faintings; till, by ſlow degrees, a very ſtrong conſtitution overpowered the latent malignity of the poiſon, and he recovered; but not without feeling the moſt various and dreadful ſymptons for ſeveral weeks afterwards.

Many have affirmed that the Rattle-Snake has the power of charming ſquirrels, hares, birds, and other animals, in ſuch a manner as to make them run directly into its mouth. In Penſylvania, this ſerpent is often ſeen baſking at the foot of a tree. There, coiled upon its tail, its jaws extended, and its eyes ſhining like fire, it levels its dreadful glare upon

SERPENTS, LIZARDS & TORTOISES.

AMPHISBÆNA

CÆCILIA

ANGUIS ÆSCULAPII

COLUBER

COLUBER

THE VIPER

THE BOIGUACU

CENCHRIS

THE RATTLE SNAKE

LACERTA

THE LION LIZARD

LACERTA

THE FROG

THE TOAD

TESTUDO

TESTUDO

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upon its prey: the little animal is incapable of breaking through the faſcination, it advances towards the ſerpent with ſeeming reluctance; at length, as if overcome by the potency of its fears, it jumps into the throat of its frightful deſtroyer.

The *whip-ſnake* is ſtill more venomous than the rattle-ſnake. It is a native of the Eaſt, and is about five feet in length, though it is not much thicker than the thong of a coachman's whip; from whence it has its name.

The *aſp* is alſo a very formidable ſerpent, but its bite is not attended with thoſe drowſy ſymptoms which the antients aſcribed to it.

The *jaculus* of Jamaica is one of the ſwifteſt of the ſerpent kind.

The *ſeps* inflicts a very venomous wound, and cauſes the part affected to corrupt in a very ſhort time.

The *coral* ſerpent is red, and its wound is ſaid to be fatal.

The *cobra di capello*, or *hooded ſerpent*, inflicts the moſt deadly and incurable wounds: there are five or ſix different kinds of this formidable creature, which are all equally dangerous; a ſpeedy death being the certain conſequence of their bite. It is ſaid the patient will die in about an hour after the wound is given; the whole frame being diſſolved into one putrid maſs of corruption. This animal is from three to eight feet long, with two large fangs hanging out of the upper jaw.

NATURAL HISTORY of the SNAKE.

THIS is the largeſt of the Engliſh ſerpents, and is ſometimes found upwards of four feet in length: the neck is ſlender; the middle of the body thick; the back and ſides covered with ſmall ſcales; the belly with oblong narrow tranſverſe plates. The back and ſides of the Snake are of a duſky brown: on the middle of the back are two rows of ſmall black ſpots, extending from the head to the tail; and the ſides are croſſed with multitudes of lines conſiſting of ſpots. The plates on the belly are duſky; the ſcales on the ſides are of a blueiſh white. The teeth are ſmall and ſerrated, lying on each ſide of the jaw in two rows. This ſpecies has a ſpot of pale yellow on each ſide of the neck; it is perfectly inoffenſive, taking ſhelter in dunghills, and among buſhes in moiſt places. It will readily take the water, and ſwims very well, its whole length generally appearing on the ſurface of the water. In ſummer the Snake is invited out by heat to baſk itſelf in the ſun. If diſturbed, they move ſwiftly away among the brambles; and, if too cloſely purſued, will hiſs and threaten, and though incapable of offending, will thus render themſelves formidable. The Snake preys upon frogs, inſects, worms, and mice. During winter it lies torpid under old trees, or in the banks of hedges.

NATURAL HISTORY of the BLIND WORM.

LIKE the ſnake, the Blind Worm is a very inoffenſive reptile, with a formidable appearance. The uſual length of this ſpecies is about eleven inches; the iris of the eye is red, the head ſmall, the neck very ſlender; the body grows ſuddenly from the neck, and continues of an equal bulk to the tail, which is blunt at the end. The back is aſh coloured, marked with very ſmall lines compoſed of minute black ſpecks; the ſides are reddiſh and the belly duſky, marked in the ſame manner as the back. This ſerpent is ſlow in its motions, on which account, (together with the ſmallneſs of its eyes) it obtained its names: ſome calling it the *ſlow*, and others the *blind* worm. Like other ſerpents in our climates, it lies torpid during winter, and many of them are ſometimes found twiſted together. Like the viper this animal brings forth its young alive. Dr. Borlaſe mentions a Blind Worm with a pointed tail, by the bite of which a man loſt his life. It is probable that the duſky viper was miſtaken for one of this kind; for it is generally agreed that the viper is the only poiſonous ſerpent in theſe kingdoms.

CHAP. II.

Containing the NATURAL HISTORY *of* INSECTS *in* GENERAL, viz. *the* SPIDER, *the* TARANTULA, *the* FLEA, *the* LOUSE, *the* BUG, *the* WOOD-LOUSE, *the* SCORPION, *the* SCOLOPENDRA *and* GALLY WORM, *the* LEACH, *the* LIBELLA, *the* ANT-LION, *the* GRASSHOPPER *and* LOCUST, *the* CRICKET, *the* EARWIG, *the* EPHEMERA, *the* CATERPILLAR, BUTTERFLY, *and* MOTH, *the* SILKWOLM, *the* BEE, *the* WASP *and* HORNET, *the* ICHNUMON FLY, *the* ANT, *the* BEETLE, *the* GNAT *and* TIPULA, *the* WORM *and its Kind*, *the* STAR-FISH, *the* POLIPUS, *the* CORAL PLANTS, *and all the Varieties of the* SEA-NETTLE.

INSECTS may be defined to be little animals without red blood, bones, or cartilages, furniſhed either with a trunk, or a mouth opening lengthwiſe, with eyes which they are incapable of covering, and with lungs which have their openings on the ſides. The whole claſs of inſects is comprehended in this definition.

Swammerdam, Reaumur, and Linnæus, have each endeavoured to abridge the taſk of deſcription, by throwing a number of ſimilar animals into diſtinct claſſes, and thus making one general hiſtory anſwer for all. We ſhall, in ſome degree, follow their example, and throw the whole claſs of inſects into four ſeparate diſtributions.

The firſt which offer themſelves are thoſe which are deſtitute of wings, that appear crawling about on plants or on the earth. Some of theſe never obtain wings, but creep on the vegetable, or the ſpot of earth where they are ſtationed for their whole lives. Others indeed are candidates for a happier ſituation, and only wait for the growing of their wings, when they may be ſaid to arrive at their ſtate of full perfection. Thoſe which remain without wings, may be conſidered as conſtituting the firſt claſs of inſects. All theſe are produced from an egg, the flea and the wood-louſe only excepted; and after they are excluded from the ſhell, they never ſuffer any further change of form; thus the louſe and the ſpider are produced

produced from an egg; and, therefore, like the chicken or the duck, remain entirely the ſame from their birth to their diſſolution.

The ſecond order of Inſects are compoſed of ſuch as have wings, but their wings are caſed up in ſuch a manner as not to appear, when produced from the egg. Theſe animals, however, are not prevented by the caſing up of the wing, from running, leaping, and moving with its uſual celerity; but, when the caſe burſts, the wings expand, all the creature's motions become more extenſive, and it arrives at full perfection. The graſshopper, the dragon-fly, and the ear-wig, have their wings at firſt bound down; but when the ſkin burſts, they are expanded, and the animal purſues the purpoſes for which it was produced.

The moth or butterfly kind form the third order of Inſects. Theſe have four wings, covered with a mealy ſubſtance of various colours, which comes off upon the fingers when they are handled. Theſe are produced in a manner peculiar to themſelves. They are firſt hatched from an egg, from whence proceeds a caterpillar that eats, and often caſts its ſkin: at length it aſſumes a new covering, which is called a chryſalis, in which it remains concealed, till it comes forth a moth or butterfly.

The fourth order of Inſects conſiſts of ſuch as have wings, which come from a worm inſtead of a caterpillar, and paſs through changes ſimilar to thoſe of moths and butterflies. They are excluded from the egg as a worm, and then become a chryſalis: at length they burſt their priſon, and come out perfect animals, ſome being furniſhed with two, and others with four wings. Theſe wings, however, are very different from thoſe of the butterfly and moth kind, as they have none of thoſe mealy particles which are always to be found on the wings of the former. The numerous tribe of gnats, beetles, bees, and flies, are comprehended in this claſs.

As a fifth order may be added a numerous tribe lately diſcovered, called zoophytes by the naturaliſts. Theſe do not go through the ordinary forms of generation, but may be propagated by diſſection. If ſome are cut into an hundred parts, each part retains life, and is endued with ſuch a vivacious principle, that it will in a ſhort time become a perfect animal. To this claſs belong the polypus, the earth-worm, and all the varieties of the ſea-nettle.

NATURAL HISTORY of the SPIDER.

THE moſt ſubtle of all inſects is the Spider. Formed for a life of rapacity, all its habits are calculated to deceive and ſurprize. In this iſland, where all the inſect tribes are kept under by human aſſiduity, the Spiders are ſmall and inoffenſive. The chief of our native Spiders are the *houſe* Spider, which weaves its web in neglected rooms; the *garden* Spider, which extends its web from tree to tree, and repoſes in the center; the *wandering* Spider, that has no fixed abode, and the *field* Spider, which ſometimes mounts web and all into the clouds. Theſe are all reputed venomous, but they are perfectly harmleſs. In Africa and America, the tribe of Spiders are much more terrible. The bottom of a Martinico Spider's body is as large as a hen's egg, and covered with hair; its web is ſtrong, and its bite is dangerous. We are happily placed at a diſtance from theſe formidable creatures, and are ſatisfied with the hiſtory of them, without wiſhing to approach them.

Every Spider has two diviſions in its body: the fore part contains the head and the breaſt, and is ſeparated from the belly, or hinder part, by a very ſlender thread, which however forms a connection between the two parts. The fore part is furniſhed with a hard ſhell, as well as the legs, which adhere to the breaſt. They have brilliant eyes all round the head; ſome are poſſeſſed of eight, and others only ſix; two are placed before, two behind, and the reſt on each ſide. As theſe animals procure their ſubſiſtence by the moſt watchful attention, ſo many eyes are neceſſary to give it the earlieſt information of the capture of its prey. On the fore part of the head they have two pincers, ſtrong pointed, and ſerrated, and terminating in claws. A ſmall hole is ſeen below the point of the claw, through which it emits a poiſon, which, though harmleſs to us, inſtantly deſtroys their prey. They have all eight legs, jointed like thoſe of lobſters, and, like them, if a joint is loſt, they are quickly ſupplied with a new one. Beſides the eight legs already mentioned, Spiders are furniſhed with two others, which may not improperly be called arms, as they do not ſerve to aſſiſt motion, but are uſed in managing their prey.

As the Spider lives wholly upon flies, and is deſtitute of wings to purſue them, it becomes an experienced hunter, and ſpreads a net to catch thoſe animals it is unable to purſue. Its web is generally laid in thoſe places where flies uſually reſort: there it remains in patient expectation for days and weeks together, ſeldom changing its ſituation.

To fabricate this web, Nature has ſupplied the Spider with a large quantity of glutinous matter within its body, and five teats for ſpinning it into thread. The threads which we ſee ſpun from theſe teats, and which appear ſo fine, are nevertheleſs compoſed of five joined together, and theſe are many times doubled when the web is in formation.

The female Spider generally lays from nine hundred to a thouſand eggs in a ſeaſon; they are of a bluiſh colour, ſpeckled with black, and are large or ſmall, in proportion to the ſize of the animal that produces them. An hour or two after the excluſion of the eggs, the female prepares to make them a bag, where they are to be hatched. For this purpoſe ſhe ſpins a web much ſtronger than that made for catching flies, and lines it with a down which ſhe plucks from her own breaſt. Within this ſhe depoſits the eggs, and ſticks it to the end of her body, by means of her glutinous fluid: thus loaded, the animal appears as if ſhe had one body placed behind another, and this treaſure ſhe ſeldom abandons but with her life.

When the young are excluded from their ſhells, the female bites open their priſon, and ſets them free; ſhe then receives them upon her back, till they have ſtrength to provide for themſelves.

Of this animal there are ſeveral ſlightly differing from each other, either in habits or conformation, but varying conſiderably in ſize. The *Bermudas Spiders* are of a very large kind. The *ſtreaked Spider* is ſpeckled with black all over its body and legs. The *Carter*, or long-legged Spider, has legs of an extraordinary length, and there is no diſtinction of the back and belly part; for the whole body appears to be nearly round.

NATURAL HISTORY of the TARANTULA.

THIS animal has ſome reſemblance to the houſe ſpider; but is the largeſt yet known in Europe. It is a native of that part of Italy, called Apulia. The body is about three quarters of an inch in length, and about the thickneſs of a man's little finger: it is generally of an olive brown, variegated with a duſky colour: it has eight legs, eight eyes, and ſharp nippers: between theſe and the fore legs, there are two little horns or feelers, which it moves very briſkly when it approaches its prey.

Its body is covered with a kind of ſoft down, and it propagates, like other ſpiders, by laying eggs. In the ſummer month, the Tarantula creeps along the corn, and bites the paſſengers and mowers; but in winter it lurks in holes, and is very ſeldom ſeen. Though the bite of this animal is attended with no dangerous ſymptoms, and will eaſily cure of itſelf, wonderful ſtories are reported concerning its virulence. The perſon bit, it is ſaid, does nothing but laugh, dance and ſkip about, putting himſelf into the moſt extravagant poſtures; this is ſucceeded by a moſt frightful melancholy, and at length the ſymptoms terminate in death. Some travellers into Italy affirm, that this extraordinary malady is only to be cured by muſic, and particularly by the violin. The medical muſician begins with a particular tune, celebrated for the cure: the patient begins to dance, and continues dancing, till he is all over in a ſtrong perſpiration, which forces out the venom that appeared ſo dangerous. Swammerdam, however, aſſures us, that even in Apulia, this ſtory is looked upon as entirely fabulous, and is kept up as a vulgar error by ſome ſtrolling muſicians, who obtain a livelihood by playing the ſuppoſed venom away.

Natural History of the FLEA.

VERY few are ignorant of the agility and blood-thirſty diſpoſition of the Flea. It is not only the enemy of mankind, but of the dog, cat, and ſeveral other animals, and is found in every part of the world. The Flea has a ſmall head, large eyes, and a roundiſh body. It has feelers, or horns, which are ſhort, and compoſed of four joints; between which its trunk is ſituated, which it buries in the ſkin, and through which it ſucks the blood in large quantities. When beheld through a microſcope, it appears to be curiouſly adorned with a ſuit of poliſhed ſable armour, elegantly jointed, and beſet with great numbers of ſharp pins, reſembling the quills of a porcupine. It has a piercing round black eye: it is furniſhed with ſix legs, which are ſo contrived, that it can fold them up one within another, and, when it leaps, they all ſpring out at once; whereby its whole ſtrength is exerted, and it can raiſe itſelf to an extraordinary height.

Natural History of the LOUSE.

THE Louſe is the enemy of man in the moſt odious degree; for whether wretchedneſs, diſeaſe, or hunger ſeize upon him, the Louſe ſeldom fails to add itſelf to the tribe, and to increaſe in proportion to the number of his calamities. In examining the Louſe with a microſcope, its external deformity ſtrikes us with diſguſt; but as the learned and elaborate Dr. Swammerdam has given us a very minute deſcription of this inſect, we cannot withhold it from our readers, though we wiſh it had been leſs ſcientific and leſs prolix. It is, however, exceedingly curious and entertaining.

"Before I exhibit," ſays he, "the internal parts viſible in this ſmall and deſpiſed animal, I ſhall deſcribe its external parts, and ſhall ſhew every thing remarkable in the head, thorax and abdomen. The ſhape of the fore part of the head is ſomewhat oblong, that of the hind part ſomewhat round; the ſkin is hard, and being ſtretched, is tranſparent like parchment, and has here and there briſtly hairs. At the extremity of the fore part is the proboſcis, or ſucker, ſeldom viſible, ſince it is always drawn to the inſide; I ſhall therefore deſcribe it when I come to the throat and ſtomach. On each ſide of the head are the antennæ, or horns, which are alſo covered with a ſkin like parchment. Each of theſe is divided into five joints, elegantly covered with briſtly hair, and ſeveral white veſſels are ſeen through theſe horns. Behind theſe are the eyes, which ſeem to want thoſe hexagonal diviſions obſervable in other inſects, and they appear to be encompaſſed with ſome few hairs.

"The neck is very ſhort, the breaſt is divided, as it were, into three parts; in the middle of which, on the back-ſide, appears, as it were a ſmall ſhield. On each ſide are placed ſix legs, each of which conſiſts of ſix joints, ſome larger than others: they are very delicately adorned with briſtly hairs, and many whitiſh veſſels are ſeen through them. The ends of their legs are armed with a ſmaller and larger ruddy and pellucid claws, ſerving theſe inſects inſtead of a finger and thumb; for by the former they take hold of a perſon's hair, and by the latter, they are able to aſcend, and run nimbly. Under, at, and upon the breaſt, where it is joined to the legs, and, as it were, in the very centre of it, there appears a ſhort whitiſh groove or channel, which is conſpicuous through the middle of the abdomen, appears of a browniſh colour, and has very ſtrong motions. On either ſide of this groove or channel are two bright little parts, like the larger before deſcribed, whoſe appendages they are, and which riſe conſiderably on the inſide of the breaſt, and are there alſo tranſparent.

"The abdomen is divided into ſix parts, and at the end of it, on the under part, the body terminates as it were in a cloven tail. Beſides theſe in the middle of the lower part of the belly, there is to be obſerved a whitiſh ſpot like a point, which is alſo tranſparent, and moves diſtinctly up and down. On the ſides and extremities of the belly, which is all over hairy, are obſerved ſome pellucid, ruddy, little bodies; and over the whole belly, a great number of white veſſels are viſible. The like are diſcernible in the back and breaſt. The ſkin of the abdomen is made like the ends of our fingers, conſiſt of ſmall grooves, but this ſtructure does not hold through the whole, and not at all at the extremities of the abdomen; for there, as well as in the whole body, it is ſomewhat firm, like clear parchment, and when roughly preſſed, it makes a noiſe and breaks.

"To obtain a perfect knowledge of all thoſe parts, which I have hitherto mentioned in general, there is no other method than to diſſect the creature. I ſhall therefore now give an exact deſcription of all the minutiæ relating to the internal parts; for by this means we ſhall have a complete idea of the external alſo.

"If we begin the diſſection in the upper part of the abdomen, and cautiouſly open the ſkin there, blood immediately iſſues from the wound, and this being received into a ſmall glaſs tube, and viewed with a powerful microſcope, is ſeen to conſiſt of tranſparent globules, as cow's milk: the ſame has been likewiſe diſcovered in the human blood for ſeveral years; it is found to conſiſt of ruddy globules ſwimming in a clear liquor.

"It is, however, a matter of doubt, whether the blood in its veſſels has any globules, for when drawn from them it may eaſily acquire that figure; this may at leaſt be aſſerted of the ruddy part of the blood. I have therefore often reſolved to put a ſmall glaſs tube into the artery of a dog, and with a microſcope to view the flowing blood. For thus, by analogy, it may be poſſible to determine with ſome certainty, whether the human blood, before it is taken out of its veſſels, contains any globules. I am the more in doubt concerning this matter, becauſe there are veſſels diſcovered in the body, which appear much finer than the globules themſelves viſible in the blood. By this means alſo may be known the true difference between the arterial and venal blood; for in the latter only, I have hitherto obſerved theſe globules, having never examined the former: nor ſhall I

I poſitively aſſert, that there are original globules in the Louſe's blood, for they may be eaſily formed by the intermixture of the blood with the fat, and ſome wounded particles of the viſcera or bowels, which conſiſt of a congeries, or heap, as it were, of globular parts; as I ſhall ſhew in its proper place. Wherefore, more time ought to be ſpent in this anatomy, than I can devote to it at preſent, being engaged in many other ſtudies.

"Immediately under the ſkin are certain muſcular fibres, which move the annular diviſions of the abdomen. I have obſerved three diſtinct kinds of theſe muſcles, ſome a little broader, others narrower, and a third ſort with two bodies. One may ſee that theſe muſcles extend themſelves from one annular diviſion to another, and that ſome are much ſhorter than others. This little animal is very full of muſcles, particularly at the extremities of the abdomen; ſince the motion is ſtrongeſt in that place, and the reſpiratory points, or orifices for reſpiration are placed there; by the aſſiſtance of which the Louſe takes in the air, and by a manifeſt act of inſpiration and expiration, draws it into the body, and again diſcharges it. When theſe muſcles are drawn from the body, they ſeem as if they conſiſted of but one fibre, but if they are dried upon a thin and clear glaſs, and waſhed with ſpirits of wine, which takes off the impure fat that adheres to them, their fibres and joints appear diſtinctly to be made up of globules.

"Under theſe muſcles the fat and the trachiæ, or air veſſels, come in view; nor could I ever hitherto diſcover any veſtige of a heart in this upper part of the abdomen, as is uſual in other inſects, wherein the heart is always placed in this upper part of the abdomen and back; but I found clearly by this diſſection that the Louſe otherwiſe agrees in all its parts with other inſects, as will hereafter plainly appear; therefore I have more diligently ſought for the heart, but in vain: this may probably be owing to its extreme ſmallneſs, ſince it is very difficult to find it in the larger inſects, as in the houſefly. There is alſo another impediment, which is, the ſtrong and continual agitation of the ſtomach in this inſect, being hardly a moment at reſt; from which there ariſes an unavoidable inconvenience in inveſtigating the heart.

"The particles which I take to be the fat of the Louſe, are for the moſt part very ſmall, but extremely numerous, though we may diſcover it in a larger ſpecies or kind of fat particles; the figure of the ſmalleſt kind of particles is uſually globular, but that of the greater is more irregular. They are of a clear tranſparent colour, like jelly; but all the other parts of this animal are not of that colour.

"The ramifications of the trachea, aſpera arteria, or wind-pipe, conſtitute the principal part of this inſect; a very conſiderable number of them are found in the head, breaſt, belly, legs; nay, and in the antennæ or horns. We may likewiſe obſerve, that they are connected and ſupported by the fat, as I have found in other inſects; and theſe are the white veſſels, which are ſeen through the tranſparent body, as I have obſerved in the hiſtory of the external parts. The reaſon that theſe pulmonary pipes are ſeen through the ſkin, is, that they are of a ſilver colour, or light bright mother-of-pearl, and therefore afford a very agreeable ſight, whilſt the animal lives. They conſtantly keep this colour, nor will they ever fade, for their ſtructure is ſuch, that they remain always open.

"As to their compoſition, it conſiſts of a double matter; a part is compoſed of rings, which reſemble the cartilages of the trachea, or wind-pipe, in man. It appears very diſtinctly by the microſcope, that theſe rings often bend themſelves round, in order to form a cavity and open pipe, but this does not happen ſo often as in other inſects, becauſe the rings of the Louſe are ſhorter: they are alſo more curled and twined, in the likeneſs of a ſerpent, and ſeem every where interrupted. It may alſo be obſerved, that where the aſpera arteria, or wind-pipe, is divided into branches, theſe rings are largeſt, but they are afterwards inſenſibly divided into ſmaller. The other part of theſe veſſels is membranaceous, and is ſituated in the interſtices of thoſe rings; and by its aſſiſtance the rings may conveniently bend and turn themſelves, as is known to happen, particularly in thoſe wonderful motions of the ſtomach, which is ſurrounded by a great number of air-pipes.

"I have hitherto omitted examining whether theſe pulmonary pipes within the body, likewiſe ſhed a little ſkin at the time the Louſe caſts its coat, as I have obſerved to have happened in the bombyx, or ſilk-worm, and in almoſt all other inſects. However, the ſmaller theſe pulmonary pipes are, the fewer rings they have, until at length they appear like more membranaceous threads.

"I may venture to affirm, that the pulmonary pipes cannot be more conveniently viewed in any ſpecies of animals that I have hitherto known, without diſſection, ſo that we cannot contemplate their ſituation and courſe, with greater admiration, in any animal than in the Louſe. But I have by me a very curious and famous apparatus, by the aſſiſtance of which, I can at any time demonſtrate it with the greateſt certainty.

"The orifices of the pulmonary pipes are ſeen in the outward ſkin of the Louſe; one of which is on either ſide of the breaſt; and on each ſide, on the extremities of the abdomen are placed ſix. I have alſo thought I ſometimes ſaw one pair of air orifices between the ſecond and third pair of legs; however, I will not be poſitive in this matter. Theſe orifices are the reſpiratory points, one of which is ſituated on one ſide, between the firſt and ſecond pair of legs, and ſix on the extremity of the belly; theſe points ſwell a little there, like a ſmall nipple, and in their circumference, ſeem to have a ſlight rim or border, which appears ſomewhat ruddy and tranſparent, as the place itſelf wherein they are fixed is alſo of a light red and bright colour; they are a little bent towards the inſide, and immediately after the tegument of the extremity of the abdomen ſwells out. All the joints are like that which I have obſerved to be placed in the breaſt.

"From every reſpiratory point there iſſues a branch of the trachea, which ſoon after forms a viſible anaſtamaſis or inoſculation with ſome branch of the trachea, that proceeds from another point, and both cloſe into one canal: the ſame holds alſo in all the fourteen apertures of the lungs; ſo that the air, which is drawn into the body by one reſpiratory point, may be ſpread through the whole. Nor is it there only that the pulmonary pipes unite, but this holds equally in thoſe which are in the back, belly, and breaſt; which laſt is diſtinguiſhed by three manifeſt ramifications that are joined together underneath. This matter hath been already elegantly delineated by Dr. Hooke, in his incomparable micography; however, he could have no knowledge of theſe ramifications by any other means, but that they appear viſible through the body.

"I am further inſtructed by the diſſection, that the pulmonary pipes may be diſcovered not only in the head, breaſt, and abdomen, but they reach alſo to the inteſtines, the ovary, ſpinal marrow, brain, and, in fine, to all the internal parts of the body of this animal; all which, as I have diſtinctly ſeen, ſo I can demonſtrate them to others, with the aſſiſtance of certain experiments which God enabled me to invent in the ſtudy of anatomy, that the miracles of

his

his works might be known: for we have not even the leaſt thing from ourſelves, for it is God that giveth us ingenuity.

" Theſe things being well underſtood, I might proceed to deſcribe the other parts, as firſt, the ovary, which appears next after the former, being a part placed upon the ſtomach itſelf: but ſince method requires us to treat, before theſe, of thoſe parts which aſſiſt digeſtion, and tend to the nouriſhment and preſervation of the body, and afterwards of thoſe which ſerve for generation, I ſhall now deſcribe the proboſcis, or ſucker, the throat, ſtomach, inteſtines, and other adjacent parts. I ſhall, after theſe, treat of the ovary, brain, and nerves, and then add ſomething concerning the outward ſkin, with which I ſhall conclude this anatomical deſcription.

" The Louſe has neither beak, teeth, nor any kind of mouth, as Dr. Hooke deſcribed it, for the entrance into the gullet is abſolutely cloſed: in the place of all theſe, it has a proboſcis or trunk, or, as it may be otherwiſe called, a pointed and hollow aculeus or ſucker, with which it pierces the ſkin, and ſucks the human blood, taking it for its food into the body. But this proboſcis cannot be ſhewn, on account of its extreme ſmallneſs; nor can it be diſtinguiſhed, unleſs a perſon happens to ſee it by chance.

" At the extreme point of the head, when preſſed out artificially, and with a particular attention, there appears an obtuſe prominence, which being hollow in the middle of the inſide, bends back into itſelf, and goes into the body, but has no aperture or opening. From this the proboſcis, or ſucker, is obſerved ſometimes to proceed, and wherefore this part is, as it were, the ſheath or caſe of it, wherein it is laid up.

" I cannot illuſtrate this ſtructure or machinery by a more proper example, than by that of the horn of a ſnail, which is likewiſe turned into itſelf on the inſide, and is again ſtretched out, but there is no perforation: wherefore, if the proboſcis or ſucker was placed at the end of it in this inſect, inſtead of the real eye which we ſee in the ſnail, one might in ſome meaſure form an idea how the proboſcis, or ſucker, is wrought in this inſect, and worked up with admirable art by the ſupreme architect of the univerſe.

" If the whole little ſheath or caſe be afterwards examined, it is obſervable, that the upper end of it is thicker than the lower, and is ſwollen like a muſhroom; ſo that it appears from hence, that the little foot on which it ſtands is ſmaller than its top. When one preſſes the proboſcis, or ſucker, and its ſheath on the outſide, we ſhall find that the end of the latter is abſolutely blunt, and reſembles the head of a pollard willow-tree, having all its branches cut off; we ſee alſo, that there are here and there certain pointed parts or claws in it, which, as well as the ſheath, and the proboſcis or ſucker, are of a light brown colour, and are tranſparent. I ſhall preſently ſhew the uſe of theſe claws; there is alſo a crooked proboſcis or ſucker in the middle of them. The outward ſkin of the ſheath which is annexed to the proboſcis, and from which its head is prominent, is of the ſame texture with the reſt of the ſkin that covers the Louſe; for it conſiſts of grooves and pellucid globules, as I ſhall explain hereafter, when I treat of the ſkin.

" If we examine that part of a Louſe's head at the time when it is ſeeking out ſome pore of ſweat in the hand, wherein to fix its proboſcis or ſucker, a ſmall line of a pale brown colour is then preſented to us, which appears viſible through the head, and has its fore part more deeply coloured.. This little line is nothing elſe but the ſheath itſelf, with the proboſcis hidden in the inſide.

" But before I explain the uſe of this proboſcis or ſucker, and its manner of riſing, it ſeems neceſſary to deſcribe the figure, ſituation, colour, texture, and motion of the gullet, ſtomach, and inteſtines; for thus the method, whereby the proboſcis performs its ſuction, will be more eaſily underſtood. The œſophagus, or throat, is a very ſmall canal, which one cannot ſee at any other time, but when the blood aſcends through the proboſcis, or ſucker, into the mouth, and paſſes through this into the ſtomach. It is ſituated a little behind the eyes, and ſeems to be carried up above the brain: the reaſon that I think ſo is, becauſe it appears there very clearly at the time of ſuction; ſo that it probably runs immediately under the ſkin of the head. In the neck it is ſomewhat enlarged, and afterwards it grows ſmall again in the back, until it terminates in the ſtomach, near which I have obſerved it, like a very ſmall, clear, and tranſparent thread, wherein a perſon that diſſects it ſometimes obſerves blood, and ſome other ſubſtance, which appears like the contents of the ſtomach. I diſcovered the whole guller, in the action of ſucking, as before deſcribed; for it is a very difficult matter to diſcover it in any other manner, becauſe, in the upper part of the back, and alſo in the head and neck, it is very ſtrongly connected with the adjacent parts.

" The ſtomach is lodged partly in the breaſt and back, but the greateſt portion of them is in the abdomen. When ſwollen with blood, it appears of a dark brown colour, which is viſible through the ſkin, and is either a faint red, or a full or bright brown, as the contents of the ſtomach are more or leſs changed. Where the ſtomach joins the breaſt above, its figure reſembles a fork with two teeth; theſe are two hidden appendages of the ſtomach, which go deep into the breaſt, and on either ſide near the gullet and ſpinal marrow, and reach to the firſt pair of legs. Theſe are thoſe two blackiſh, tranſparent and coloured parts, which I have mentioned in general in the hiſtory of the external parts.

" The part of the ſtomach connected with the abdomen, deſerves particular conſideration; it is formed like an oblong bag, which is here and there continually contracted and again extended. When it is empty, it is colourleſs, and the ſtomach and its appendages are tranſparent. But as the ſtomach fills, the colour is ſeen plainly through the outward ſkin. It manifeſtly conſiſts of two coats, the outward is thicker, the inner very thin, as it is in all inſects. Nay, it is probable that it has three coats, and that the third is muſcular.

" The outward coat of the ſtomach is furniſhed with ſo great a number of pulmonary pipes as can hardly be expreſſed in words. The longer branches are very conſpicuous in it, but the ſmalleſt cannot be diſcovered, except by the aſſiſtance of the beſt microſcopes. On the contrary, the inward coat is very thin; the third, which I ſuppoſe to be ſituated between the two former, comprehends, without doubt, the muſcular fibres of the ſtomach, by the help of which it performs its wonderful motions. The coats of the ſtomach, eſpecially the outmoſt, appear to conſiſt of very many globular little grains, which are very irregular in form; but whether theſe little grains properly belong to the texture of the ſtomach, or whether they are rather particles of the fat, which cover the ſtomach, whereby the pulmonary pipes are gently moved, I could not well diſcern; only this I know, that the greateſt part of them, when often touched, retire from the ſtomach.

" Underneath, in the abdomen, on a little riſing, or prominence, nearly in the middle of the ſtomach, there is ſeen a certain little part, which Doctor Hook apprehends may be the liver; but I ſhould rather take it to be the pancreas, or ſweetbread, though

though there want ſufficient arguments to prove it. Its colour is not properly whitiſh, but ſomewhat inclining to yellow; and it is ſo ſtrongly connected with the ſtomach, that it cannot be eaſily ſeparated from it. If this be laid before the microſcope, it may eaſily be divided into many little grains, like glands, but theſe are not very tranſparent. When it is accurately viewed by the microſcope, the pulmonary pipes alſo appear in it. The ſubſtance of this little part is more firm than that of the reſt, for when it is extracted from the body and dried, it is but little diminiſhed. It is of a very irregular figure, and is formed divers ways in almoſt every Louſe, being ſometimes greater and ſometimes leſs; but it is always finiſhed in the ſame general manner, by reaſon of its bendings and ſituation over the ſtomach.

"At the lower region of the ſtomach is ſeen the pylorus, and immediately from this, the inteſtinum tenue, or ſmall gut, which is extended on each ſide, and formed like the ſtomach: this is alſo provided with a great many pulmonary pipes. At the end of this ſmall gut, which is for the greateſt part bent in a ſerpentine manner, or like the letter S, are diſcovered four ſmall veſſels, which the ſagacious and excellent anatomiſt Marcellus Malpighius, has called the ſwollen veſſels in ſilk-worms; but theſe are ſtraighter and leſs inflected than the Louſe; they are conſiderably long, and of the ſame texture with the inteſtines. Theſe four little veſſels are properly four inteſtina cæca, or blind guts, which I have found in all inſects; wherefore, by inference, I call them here by this name, though I never have had the fortune to ſee their extremities. They open into the inteſtine, from whence they ariſe at the place juſt mentioned. After theſe appears the little inteſtine colon, and at the end of that, there is a manifeſt dilatation or extention, which is the cloaca, or place where the excrements acquire their figure; for they are very irregular, and not like thoſe of other inſects, which are uſually formed in a ſingular and regular manner. Within this dilatation appears the inteſtinum rectum, which ſhews its aperture, as the anus ſituated upon the belly, between the diviſion of the tail; and juſt under this the ſkin is very briſtly.

"As to the motion of the ſtomach, it is truly admirable; inſomuch that one might ſuppoſe it an animal within an animal, by reaſon of the ſtrong agitations, contractions, dilatations, corrugations, and expanſions, all which belong to it, and ſtrike one with amazement, the whole being plainly ſeen through the body. Theſe appear plainly at the time when the ſtomach is full of food, but they are beſt of all ſeen, when the blood paſſes into it at the time of ſucking; for then it is ſometimes obſerved, that the remainder of the old aliment is mixed with the new, and is ſhaken and agitated up and down, and on every ſide, in the ſtomach. This may be ſeen the more diſtinctly, as the colour of the contents is more dark.

"Hence one may eaſily conceive what ſtrange changes and emotions the pulmonary pipes on the ſtomach undergo at that time, and after what various ways the air contained in them is preſſed, moved, propelled, and ſo purified; changed from its firſt nature, and rarified within the creature. But who can diſcover, by the moſt diligent reſearches, the uſe of the air in that place? ſurely no one. Yet, very wonderful motions are obſerved on this occaſion, particularly in that little part which I called the pancreas, or ſweet-bread; for this being connected with the ſtomach, muſt obey all its motions. Theſe motions are continually repeated by turns, and undergo an infinite number of variations.

"As to the method whereby the Louſe ſucks the blood, and conveys that nouriſhment into the ſtomach, it is performed thus, by the aſſiſtance of the proboſcis, and its aculeus or point. Firſt, if the Louſe has abſtained from food two or three days, it becomes very hungry, which is diſcoverable from the empty ſtomach, and becauſe the creature is then wholly tranſparent; in this caſe, immediately as ſoon as he is placed on the hand, he ſeeks for food, which he will the ſooner and more readily find, if the hand be firſt rubbed until it grows red. Then the Louſe turns its head, which lies between the two fore legs, to the ſkin, and diligently ſearches for ſome pore of ſweat: when he finds it, he fixes his aculeus or ſucker therein; a little after this, the blood is obſerved, through the microſcope, to aſcend to the head, in a very rapid, and, as it were, frightful ſtream.

"The Louſe has at that time matter enough to feed on in any paſture; for if it finds any hairs on the hand, by which it does not deſire to deſcend, it ſtays in that paſture, and ſucks with its head down, and its tail elevated. I have likewiſe obſerved, that it ſometimes ſucked with its belly upward, that is, when the hair it took hold of was bent down; and then the motion of the ſtomach, and pancreas, or ſweet-bread, might be ſeen moſt beautifully by the help of a microſcope.

"But I ſhould think the principal uſe of the claws, which I have deſcribed to be ſituated at the end of the ſheath or caſe of the aculeus or ſucker, is to aſſiſt the creature in ſucking, and that the aculeus ſerves for this purpoſe; for whilſt theſe are ſtrongly fixed in the ſuperficies of the inner ſkin, and in the extremities of the pores, they enable the Louſe to uſe its aculeus the more freely, and to move it at diſcretion, when the end of its ſheath is placed firm and immoveable.

"Sometimes, whilſt the Louſe was ſucking, I have ſtrongly pulled the ſkin of my hand aſide, that by this means the ſheath, or rather its claws, together with the aculeus or ſucker, might be bound faſt in the ſkin, and the Louſe could not diſengage itſelf. This affords, indeed, a very agreeable ſight. This I did with a deſign, that if I could thruſt the Louſe out of its place, I might the more plainly ſee the aculeus: but I could never accompliſh my deſire in this particular, though I had then almoſt wiſhed to have three hands, that I might the better find what I wanted. There are ſome ſpeculations and reſearches in anatomy that will not bear writing, ſince they almoſt diſtract the mind.

"When the Louſe is employed in ſucking, a very ſmall rivulet of blood immediately appears behind the aculeus or ſucker, which is ſeen through the tranſparent head. Between and before its eyes, on the middle of the head, there is obſerved alſo a conſiderable dilatation, for the jaws are there remarkably expanded, by the blood continually aſcending. Theſe parts are ſo ſwiftly contracted again, that there ſcarce remains the leaſt ſign of blood after a moment, and both are performed with ſuch velocity, that the dilatation can hardly be diſtinguiſhed from the contraction; wherefore I do not know how to explain this matter more properly, than by the ſudden oſcillation of the pendulum of a clock. Behind the eyes, a ſmall rivulet of blood is likewiſe obſerved to run down within the head: this paſſage may be properly called the œſophagus or gullet, which lies behind the jaws, and grows wide again in the Louſe's neck, as has been ſhewn before. I have choſen to exhibit all theſe as one continued canal, that my deſcription may be the more clear.

"After the blood has aſcended to the jaws, and comes to the gullet, we obſerve that it is immediately conveyed to the ſtomach, and that the biſurcated appendages, as well as the ſtomach itſelf, are at once filled with it. The motions of the ſtomach are then remarkably increaſed, its muſcular parts being

being diſtended; for as theſe muſcular parts are then ſtretched, they have an opportunity of contracting themſelves again. Wherefore it is immediately obſerved, that the excrements in the large guts begin likewiſe to move; nay, it uſually happens, that the Louſe diſcharges them during the ſucking.

"The food being thus received into the ſtomach, is agitated about in a wonderful manner; it is moved up and down, and by contractions and dilatations, which are not to be deſcribed, then performed by the ſtomach, is, as it were, ſifted. After this, it is ſeen, that the contents firſt begin to divide into parts in the back, or hinder portion of the ſtomach, and they then appear like raiſins preſerved in jars, and are thus diſtributed through the body. However, this is a falſe appearance; it ariſes from hence, that the ſkin being divided into many grooves, is not equally tranſparent every where, and that ſome difference is in this reſpect ſeen through it, becauſe the grooves are not equally tranſparent with the intermediate parts. Nay, the particles of the internal fat not being uniformly viſible through the ſkin, and obſcuring the brightneſs of the ſkin, conduce likewiſe to deceive the ſight, as if the retreating blood entered into many peculiar veſſels. To this may be added, that the blood has not at that time a homogeneous or equal colour, for its parts ſeparate from each other. From theſe appearances, before I had accurately examined things, I thought that the blood was diſtributed out of the ſtomach, through various veſſels, into the other parts of the body; but I afterwards obſerved that the phænomenon aroſe, as well from the blood itſelf, as from the different colours of the parts through which it was ſeen, and which I then took to be veſſels. Perhaps others, eſpecially Dr. Hooke, who firſt prejudiced me in favour of this opinion, have ſplit on the ſame rock. I have not as yet made this experiment on the ſmalleſt Lice, in which more peculiarities may probably be ſeen, than in the larger kind.

"I have likewiſe reſolved to receive the blood, when changed in the ſtomach, into a glaſs tube, and then to view it in the open air, or in ſome dark place by candle-light; but this I have not hitherto done, being hindered from making this, as well as many other experiments which I had a mind to try. In ſome hours after feeding, the contents of the ſtomach are obſerved to become inſenſibly more brown or blackiſh, and to diminiſh ſlowly; wherefore the inteſtines are afterwards ſeen to be more and more diſtended with excrements, which ſometimes lie in them regularly divided, as it were, into globules. The reaſon of this is, that the inteſtines do not, at one and the ſame time, contract themſelves about the fœces, and therefore they caſt or extrude them out of the body at different times. I have already treated of the muſcles of the abdomen in this inſect, I ſhall now proceed to the parts of the breaſt.

"In this part, and in the back, are ſeen ſeveral muſcles, which move the legs and head; and herein are alſo viſible the appendages of the ſtomach, and a great number of pulmonary pipes and particles of fat. In the ſame view is alſo ſeen the gullet and ſpinal marrow, together with the nerves ariſing from thence, of which I ſhall now ſpeak diſtinctly.

"In the middle of the back is ſeen a certain tendinous point, under the ſmall ſhield there ſituated, where the ſkin does not appear to be ſo tranſparent as in the reſt of the body. This ſhield ſeems there to be hollow, being thruſt down into a little pit. At this point almoſt all the muſcular fibres are ſeen to concur, and their motion and contraction are here very viſible. As to the appendages of the ſtomach, and other parts of the breaſt and back, we have before treated of them at large.

"The ſpinal marrow is properly ſituated in the breaſt, and therein reaches to the inſertion of the laſt pair of legs. When this is diſcovered, it is eaſy to judge what that ſhort whitiſh groove is, which appears through the breaſt, between the appendages of the ſtomach; for theſe appendages are placed on both ſides of the ſpinal marrow. The ſtructure of the ſpinal marrow itſelf, does not differ much from that found in the worm, from which the Scaraboeus Naſicornis, or Horned Beetle, by the ancients conſecrated to Mercury, is produced, as is manifeſt from the hiſtory and figures of the latter. It conſiſts of three remarkable ſwellings, expanſions, or dilatations, from which, on either ſide, we obſerve three nerves to ariſe, which reach to the muſcles of the ſix legs; but underneath, or in the hinder part of it, I diſtinguiſhed ſix nerves iſſuing, which doubtleſs are diſtributed through the reſt of the viſcera, to give them life, ſenſe, and motion. The loweſt of thoſe little knots, whereof the ſpinal marrow is compoſed, is formed in a different manner from the upper ones, which are alike. The membrane which covers the marrow is interwoven with a great many pulmonary pipes, and ſeems to be compoſed of irregular and globular little parts, in the ſame manner as we have ſhewn in reſpect of the coat and ſtomach; and this texture, together with the great number of pulmonary pipes belonging to the part, afford a very agreeable ſight in the living inſect.

"I could diſcover no fibres in the nerves, which ariſe from the poſterior part of the marrow, though I viewed them freſh with the microſcope; they ſeemed indeed to be made up of a homogeneous, bright and tranſparent matter, and at their ſides were hung a great many pulmonary pipes, with particles of fat. The origin of the marrow, where it is connected with the brain, is ſeen like a fine thread. But in all other inſects this beginning of the marrow is perforated, and through its aperture or cavity the gullet paſſes.

"The brain of the Louſe is ſhaped like a pear, and is divided into a right and left part. The dura mater, ſurrounding it, is formed like the membrane which covers the marrow, and is provided with pulmonary pipes and particles of fat. I can very eaſily at any time ſhew the marrow, but the demonſtration of the brain muſt be obtained rather by chance, than with any premeditated deſign or art; it is clearly ſeen, when by any accident it happens to be ſtript of the parts wherewith it is covered.

"The optic nerves are ſhort, and the eyes, which are connected to them, are ſo ſmall, that I could not diſſect them to my ſatisfaction; as well becauſe this operation is but aukwardly performed under microſcopes, which magnify objects ſo much, that all inſtruments are too coarſe for this purpoſe. Thus much, however, I diſtinctly ſaw, that this black part in the eyes might be ſeparated or lifted up from them; which part in other inſects I call the tunica uvea, not being ſituated at the bottom, but on the ſuperficies of the eye; after this appears the tunica cornea; this ſeemed divided, as it were, into hexagons, as it is in other inſects, though the other was not: but that I would not affirm for certain, for we are not to ſuppoſe or imagine, but to purſue by our ſenſes, and diſcover the actions and productions of nature. This opinion, however, does not pleaſe ſome anatomiſts, who therefore eſteem all comments on the brain merely as ingenious fancies. The younger Bartholinus, who, ſpeaking of the fiction that ſilkworms had no brain, expreſſes himſelf thus: "Behold, how many are pleaſed with their own blindneſs! who, altho' they are blind, and ſhall for ever remain ſo, yet cry aloud they can ſee, ſince theſe their contemptible works, which ought to be removed from their eyes, and buried in oblivion, are laſting monuments of their cloudy arrogance; for by

by this means they might afterwards ſeek for the light of the truth."

"Whether Lice are diſtinguiſhed by the parts of generation, into males and females, as other inſects are, I could not diſcover. Heretofore, indeed, I had ſometime remarked, that Lice get upon each other; but this I could not obſerve while employed in this diſſection. I found an ovary in every one of forty, which I diſſected; this almoſt inclined me to think, that theſe little animals are hermaphrodites; and perhaps they really have in each animal the generative parts in the ſame body, as I have found in ſnails. Whether, indeed, it be ſo, is ſtill a ſecret to me; for though I ſaw the ovary very diſtinctly, I could diſcover that only, notwithſtanding the great hopes I had of finding it, from having obſerved, that all kinds of inſects have very large organs of generation.

"The ovary is extended through the whole cavity of the abdomen, ſo that with its appendages it reaches even to the breaſt. It has an opening diſtinct from the end of the inteſtines, for as the upper part of the fundament is placed in the diviſion of the tail, in which the abdomen ends; ſo, on the contrary, the vagina or mouth of the ovary opens into the lower part of the abdomen, where the body is divided, as it were, into two parts. The ends or extreme appendages of the oviduct, or egg-paſſage, are like two tubes, naturally joined in one point. In the oviduct are ſeen at once perfect eggs, and their rudiments or principles; ſo that in one ovary I have counted ten larger and forty-four ſmaller eggs, together making fifty-four. In the uterus I ſaw one perfect egg, which was fallen down ready for birth: at that time theſe little eggs are called nits.

"The ovary is double in all Lice, and every part of it is ſubdivided into five oviducts, which on each ſide end in one common canal; next comes in ſight the uterus, in which the egg acquires its full perfection. Where the uterus ends, is ſeen a ſacculus or bag full of a glutinous matter, opening in that part into the uterus; this is deſigned for faſtening the eggs, whilſt they are laying; the ſame may be likewiſe obſerved in many other inſects, and particularly in bees. I muſt acknowledge that I have not ſeen the glutinous matter contained in this bag; but I infer, from the ſituation and ſtructure of the part, that the bag was deſigned for keeping ſuch a ſubſtance. After this appears the neck of the uterus, and therein is a ſmall dilatation or expanſion; by means of which, the ovary immediately opens itſelf into the outward womb.

"The oviducts embrace the eggs ſo cloſely, that ſcarce any difference is obſerved between them, nor can we ſeparate the oviducts from the eggs, without great labour; when we do this, a great many bags of fat iſſue from thence, which obſtruct the ſight. It therefore has appeared to me, that the ſtructure of the oviduct is the ſame with that of the ſtomach and inteſtines; though the texture of this part is nevertheleſs more delicate, and that the globular particles proceed from thence with greater eaſe, than in the other viſcera. The oviducts are provided with many pulmonary pipes, of which, as we have already obſerved, this little animal has a very large number, though no bigger than a point; its ſtructure and viſcera, which excel all human art, the greateſt geniuſes ought to be amazed at, as I have here, though briefly, yet clearly explained and demonſtrated. I am perſuaded that I might make many more diſcoveries in it, if I had more time for that purpoſe, ſince I have completed this diſſection, and diſcovered theſe remarkable miracles in this microcoſm, or little world, in the ſpace of ſix days. If the learned Daniel Heinſius had ſearched for theſe things in nature herſelf, and not in his own fancy, and in books, he would not have written ſo poor an encomium on this inſect.

"As to the ſtructure of the external ſkin of the Louſe, it affords many particulars worthy of obſervation, nor is there any thing that bears a greater likeneſs to it, than ſtiff and tranſparent parchment: it is in ſeveral places marked with ſmall grooves or channels, in the ſame manner as the ends of our fingers; which, when viewed with the beſt microſcopes, really ſeem to be ſo many diviſions of pulmonary pipes. But the lens of the microſcope muſt, for this purpoſe, be carefully managed; for as it is turned one way or another, different things are ſeen: one cannot bring the lens nearer, or remove it further, by the leaſt diſtance, but ſomething is immediately perceived by the ſight, which was not obſerved before. Globular particles, ſometimes appear in the place of channels, or oblong pipes, tho' the eye is always fixed on the ſame part; then between the grooves themſelves, where the ſkin is ſimply membranaceous, globular particles are likewiſe obſerved. In other places, as in the extremities of the abdomen, the ſtructure of the ſkin is different; for there it ſeems to be compoſed, as it were, of irregular ſquares, wherein circular grooves may be ſeen in one part; in another globules; in a third, both globules and grooves, nay, ſometimes the plain tranſparent ſkin only is ſeen full of points; all which, as we have before obſerved of the oblong grooves, are repreſented according to the tranſparency of the parts, which have not been yet totally ſeparated from the inner ſurface of the ſkin; or juſt as the microſcope is moved, ſomewhat nearer to, or farther from the ſkin."

NATURAL HISTORY of the BUG.

THIS alſo is a nauſeous inſect, which intrudes upon the retreats of mankind. The night is uſually the ſeaſon when the wretched have reſt from their labour; but this ſeems the only ſeaſon when the Bug iſſues from its retreats to make its depredations. It cunningly avoids the light; but when darkneſs promiſes it ſecurity, it iſſues from every corner of the bed, and greedily attacks its prey. Happily, however, for Great-Britain, they multiply leſs in that iſland, than in any part of the continent: in France and Italy the beds ſwarm with them; and in thoſe countries they grow larger, and bite with a more cruel appetite than they do with us.

This animal conſiſts of three principal parts; the head, the corſelet, and the belly. It has two feelers, with three joints; beneath theſe there is a crooked trunk, which is its inſtrument of torture, and which lies cloſe upon the breaſt when it is in motion: the breaſt is a kind of ring, and the belly conſiſts of nine rings. It has ſix legs: its body is ſmooth, except that it has a few ſhort hairs near the vent, which may be ſeen by the microſcope: its motion is ſlow and unwieldy. The ſmell of this inſect, when killed, is inſupportable.

Linnæus reckons up forty of the Bug kind; but the principal are the common Bug; the green and yellow Bug; the plant Bug; and the graſs Bug.

NATURAL HISTORY of the WOOD-LOUSE.

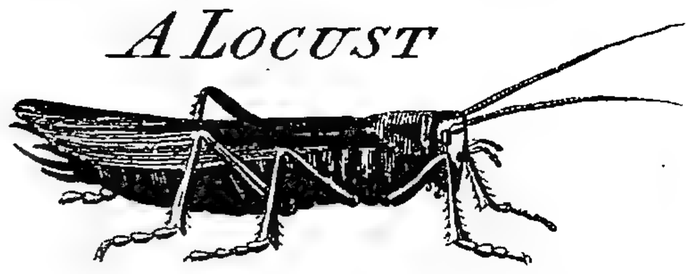
THIS inſect ſeldom exceeds half an inch in length, and a quarter of an inch in breadth. Thoſe found about dunghills, and on the ground, are uſually of a livid black; but thoſe found under timber, tiles, and in drier places, are of a lighter colour. Of this inſect Linnæus makes three ſpecies; that with ſeventy feet on each ſide; that with fifty; and that with twenty: it has two ſhort feelers, and the body is of an oval ſhape. When touched, it rolls itſelf up into a kind of ball; and the ſides, near the

INSECTS.

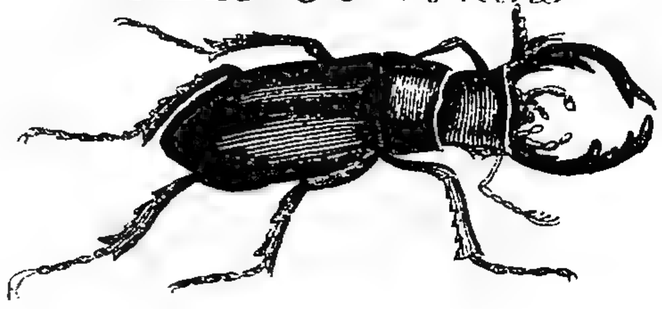
DRAGON Fly

LANTERN Fly

A LOCUST



CERVUS volans



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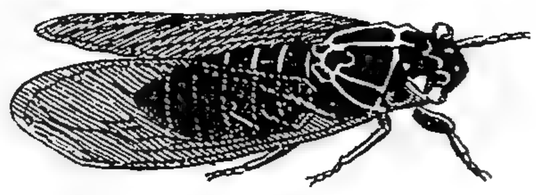

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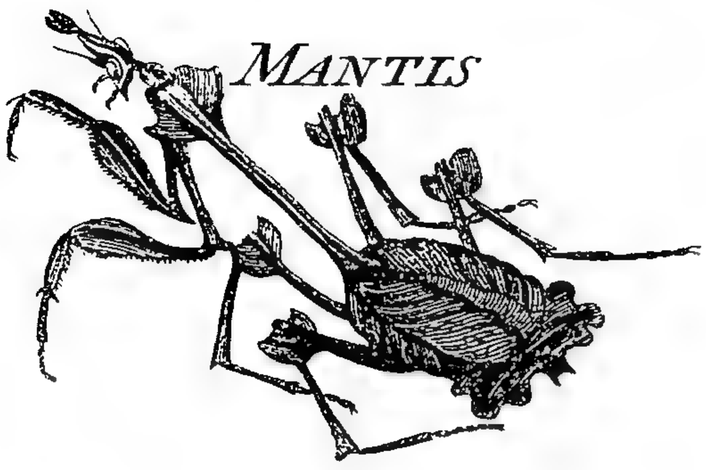
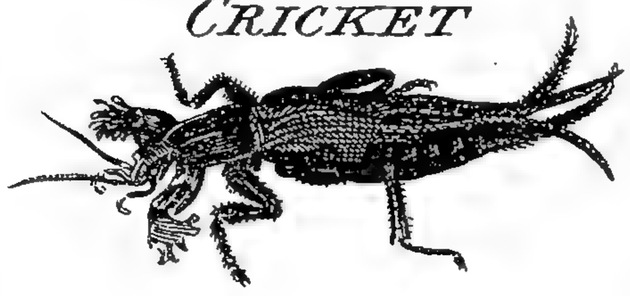
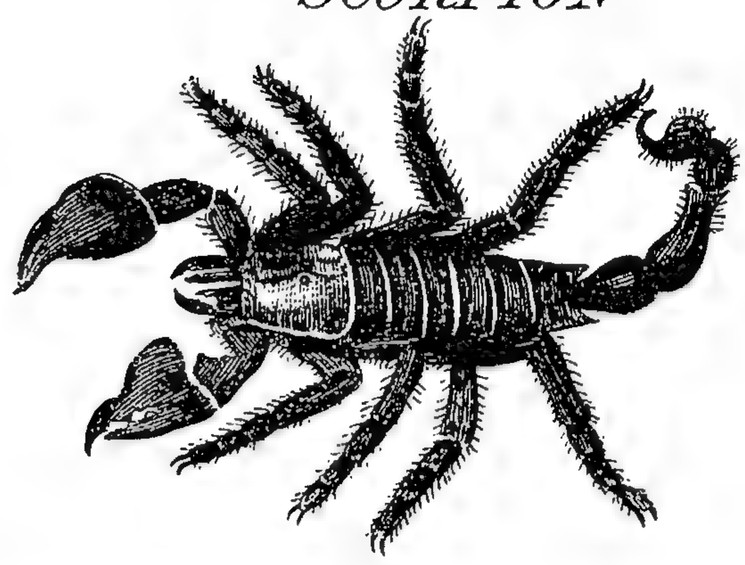


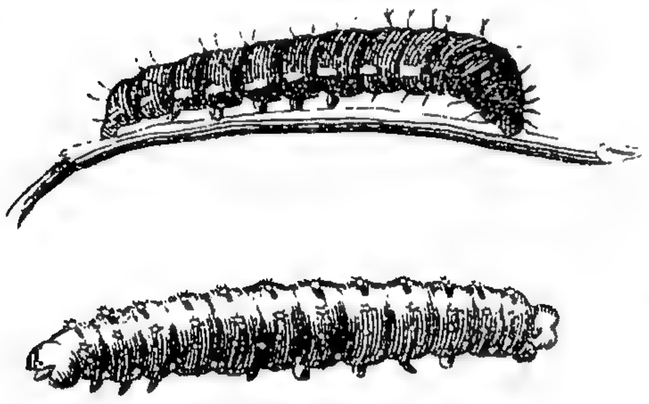
Gryllotalpa, or Mole CRICKET



SCORPION

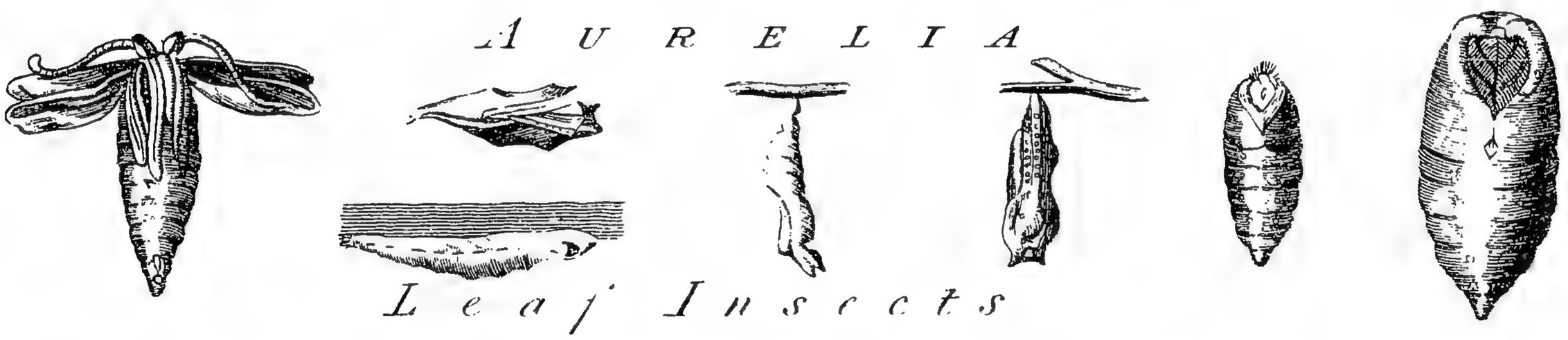


CATERPILLAR



PAPILIO

AURELIA



Leaf Insects

of the Oak

of the Honeysuckle

of the Trefoil

of the Ranunculus

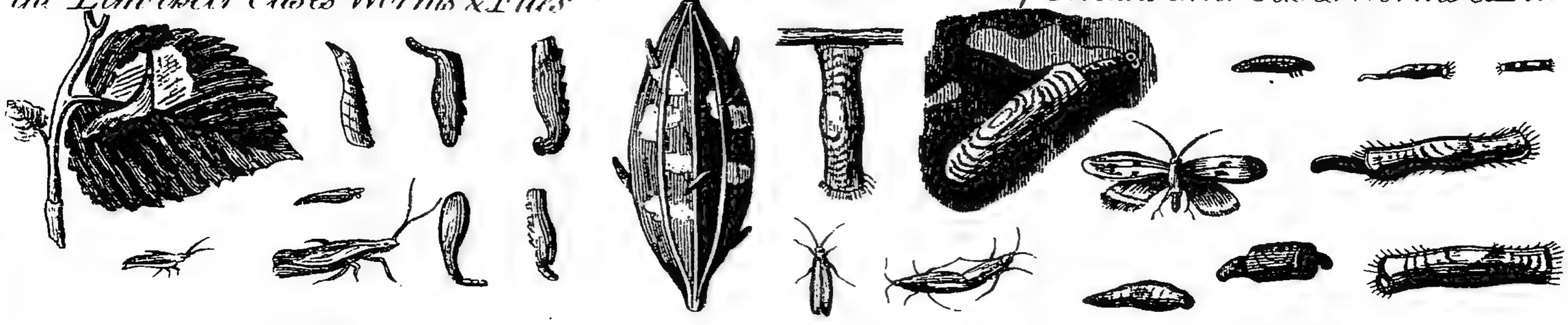
of the Sow Thistle

TÆNIÆ

of the Elm their Cases Worms & Flies

of the Lychens

of Cloaths their Cases Worms & Flies.



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Lowry sculp.

the feet are dentated like a ſaw. Wood-Lice have great medicinal virtues, being impregnated with a ſaline quality, which is diuretic and ſtimulating.

The MONOCULUS, or WATER FLEA.

Water Fleas are of a blood colour, and are ſometimes ſeen in ſuch multitudes on the ſurface of ſtanding water, that many people have taken it for blood. It is peculiar to the water, and has the legs before divided into branches, with which it either ſwims or leaps, and the body is covered with a cruſt or ſhell. It appears to have but one eye.

NATURAL HISTORY of the SCORPION.

THIS is one of the largeſt of the inſect tribe, and is not leſs terrible from its ſize than its malignity. Its ſhape ſomewhat reſembles that of a lobſter, but is infinitely more hideous. Nine different kinds of this dangerous inſect have been enumerated; but they are principally diſtinguiſhed by their colour: ſome are yellow, others brown; ſome are of an iron grey; and others are black, red, and white. The head of the Scorpion ſeems to be joined to the breaſt; in the middle of which are ſeen two eyes, and two others are placed more forward in the fore part of the head: theſe eyes are ſo ſmall as to be almoſt inviſible. On each ſide of the head are two arms, each compoſed of four joints; the laſt of which is large and ſtrong, and reſembles a lobſter's claw. Below the breaſt are eight articulated legs, each divided into ſix joints, the two hindmoſt of which are each provided with two crooked claws. The belly is divided into ſeven little rings; and the tail is compoſed of ſix joints, which are briſtly, and appear like little globes; the laſt being armed with a crooked ſting: this is that fatal inſtrument which renders this inſect ſo truly miſchievous and formidable. As it generally takes ſhelter in houſes, it frequently ſtings thoſe among whom it reſides. In ſome of the towns of Italy, and in the province of Languedoc, in France, it is one of the greateſt peſts that torment mankind: but by the natives of Africa and the Eaſt, their malignity is woefully experienced. In Batavia, where they grow twelve inches long, a piece of furniture cannot be moved in the houſe without the utmoſt danger of being ſtung by them. We are aſſured by Boſman, that, along the Gold Coaſt, they are frequently ſeen larger than a lobſter; and that their ſting is inevitably fatal. In Europe, however, they are neither ſo plenty, ſo large, nor ſo venomous. There it ſeldom exceeds two or three inches in length, and its ſting is not often fatal.

NATURAL HISTORY of the SCOLOPENDRA and GALLY WORM.

WE know little except the figure and the noxious qualities of theſe inſects. We have ſome in this country that reſemble them in form, but we are placed at a happy diſtance from ſuch as are really formidable. With us they ſeldom exceed the length of an inch, but in the tropical climates they are ſometimes found nine inches long. The Scolopendra, from the number of its feet, is alſo called the centipede. Thoſe of the Eaſt Indies are about ſix inches long, of a ruddy colour, and as thick as a man's finger: they conſiſt of many joints, and have a leg on each ſide of every joint: they are covered with hair, and ſeem to have no eyes: the head is round, and furniſhed with two ſmall teeth, with which they inflict wounds that are painful and dangerous.

The Gally Worm differs from the Scolopendra in having double the number of feet: ſome of them are ſmooth and others hairy; ſome are black, others yellow, and others brown. When touched, they all roll themſelves up in a ball. In Europe they are perfectly harmleſs. All theſe, as well as the ſcorpion, are produced perfect from the parent or the egg, and ſuffer no changes after excluſion.

NATURAL HISTORY of the LEACH.

THE common Leach is a water inſect: it has the general figure of a worm, and is about as long as a man's middle finger. Its ſkin is compoſed of rings, by means of which it ſwims with ſome agility in the water. When out of the water it contracts itſelf in ſuch a manner, that, when touched, it is not above an inch long. It has a ſmall head, and a black ſkin, edged with a yellow line on each ſide: the belly is of a reddiſh colour, marked with whitiſh yellow ſpots. It is remarkable, that the mouth of this animal can aſſume whatever form it finds convenient. When at reſt, however, the opening is uſually triangular, and within it are placed three very ſharp teeth. Theſe animals are very uſeful in medicine, and when they are applied, they ſhould be taken from the water, in which they are contained about an hour before, for they thus become more voracious, and faſten more readily. The moſt remarkable particular of this animal is, that tho' it takes a large quantity of food, it has no paſſage to eject it from the body when it has been digeſted: it is ſuppoſed to go off thro' the pores of the body.

The *horſe-leach* is larger than the former, and grows to four inches in length. It has a ſmooth gloſſy ſkin, black on the back, ſpotted with grey. It is of no uſe, as it will not ſtick to the ſkin.

The *ſnail-leach* is about an inch in length, and of a very flat ſhape: its ſkin is ſmooth and gloſſy, and of a whitiſh colour. This leach will ſtick, tho' it is not large enough to extract a ſufficient quantity of blood from the patient.

The *broad-tailed* Leach grows to an inch and an half in length, and has a ſmooth gloſſy ſkin, of a duſky brown colour. The back is raiſed into a kind of ridge. It will ſtick but on very few occaſions. It is common on ſtones in ſhallow running waters.

NATURAL HISTORY of the LIBELLA, or DRAGON FLY.

THESE inſects are called by different names in different parts of the kingdom: they are of all colours, blue, green, crimſon, white, ſcarlet, or a union of the moſt agreeable tints. They are diſtinguiſhed from all other flies, by the length of their bodies, the largeneſs of their eyes, and the beautiful tranſparency of their wings, which are four in number. Though there are three or four different kinds of Dragon Flies, they all agree in the moſt ſtriking parts of their hiſtory. The largeſt are from two to three inches long; their tail is forked: their body divided into eleven rings; and their wings are of a beautiful gloſſy tranſparency. They have two teeth, covered with a beautiful lip; they bite fiercely when they are taken; but their bite is perfectly harmleſs. Theſe animals are produced from eggs, depoſited in the water; they afterwards become worms, and have ſix legs; they continue in their reptile ſtate for a year; at length their wings expand, and they enter upon the flying ſtate.

NATURAL HISTORY of the ANT-LION.

THIS inſect in its reptile ſtate, is of the ſize of a common wood-louſe, but ſomewhat broader. It has a longiſh head, and a roundiſh body, which becomes a little narrower towards the tail. The colour is a dirty grey, ſpeckled with black. The body is compoſed of ſeveral flat rings, which ſlip one upon another. It has ſix feet, four fixed to the breaſt, and two to the neck. It is generally produced in autumn, and in about a year afterwards it aſſumes a winged form, and becomes a large and beautiful fly of the libellular kind, with a long ſlender body of a brown colour; with large bright eyes, long ſlender legs, and four large tranſparent wings.

NATURAL HISTORY of the GRASS-HOPPER, and the LOCUST.

THERE are a tribe of little animals, which, though differing in ſize and colour, ſtrongly reſemble each other in figure, appetite, and nature. Of this variegated tribe, the common Graſs-Hopper, that is found in ſuch plenty in every meadow, and that continues chirping through the ſummer, is beſt known to us; and a hiſtory of that will contain a hiſtory of all the reſt. The colour of this animal is green, with a line of brown which ſtreaks the back, and two pale lines under the belly and behind the legs. The head is oblong, in ſome degree reſembling that of a horſe. The mouth is armed with teeth of a brown colour, hooked at the point. The corſlet is elevated, narrow, armed above and below by two ſerrated ſpines. The back is armed with a ſtrong buckler. The laſt pair of legs are longer and ſtronger than the firſt two pair, fortified by thick muſcles, and admirably formed for leaping. It has four wings; the belly is compoſed of four rings, and terminated by a forked tail.

The Graſs-Hopper, though ſeemingly without wings, is in reality poſſeſſed of them from the firſt, but it cannot break the bonds by which they are folded up, till it has been excluded above twenty days. When arrived at their winged ſtate they are ſtill vocal, and in the midſt of ſummer, are heard much louder at ſun-ſetting than during the heat of the day. Though ſlow in flight, they are ſometimes ſeen to fly to conſiderable diſtances.

The larger kinds differ from this only in ſize, rapidity of flight, and the powers of injuring mankind, by ſwarming upon the productions of the earth. The graſs which is deſtroyed by a few Graſs-Hoppers which ſport in our fields can be of no great conſequence; but when a ſwarm of Locuſts, two or three miles in length, and ſeveral yards in depth, ſettle upon a field, the conſequences are frightful.

Europe is ſeldom viſited by them in this manner. Thoſe which were ſeen in ſeveral parts of England in the year 1748, were the great brown Locuſts, and dreadful conſequences were apprehended from their appearance. They were about three inches long.

Locuſts are eaten by the natives in many kingdoms of the Eaſt. They certainly were a common food with the Jews, as Moſes, in the book of Leviticus, permits them to eat four different kinds of this animal, which he particularly ſpecifies.

The great Weſt Indian Locuſt is the moſt noxious of this tribe of animals. It is armed with a ſting, and thoſe who touch it are ſure to be ſtung by it: a little palm-oil, however, is a certain cure for it.

NATURAL HISTORY of the CRICKET.

THIS inſect reſembles the graſs-hopper in its ſhape, its voice, and its leaping; but its colour is uniformly of a ruſty brown. Its reſidence is moſt uſually in the warmeſt chinks behind a country hearth. It is of a moſt chilly nature, ſeldom quitting the fire ſide. It is a voracious little animal, and will eat ſugar, bread, meat, or flour. Except in the very coldeſt weather, they never ceaſe their chirping.

There is a ſpecies of this inſect that lives entirely in the woods and fields.

The Mole-Cricket is a very large inſect, being two inches and an half in length, and three quarters of an inch in breadth. It chiefly reſides under the ſurface in ſoft garden grounds, and is very injurious to gardeners.

NATURAL HISTORY of the EARWIG and the FROTH INSECT.

THE Earwig is ſo common as hardly to require a deſcription: it is equally remarkable for its ſwiftneſs in the reptile ſtate, and its velocity when it has arrived to its winged ſtate. It is very prolific, and very harmleſs. The name, and the deformity of its figure, have ſubjected it to an imputation which has often procured its deſtruction. It is ſaid that it often enters into the ears of people ſleeping; thus cauſing madneſs from the intolerable pain, and ſoon after death itſelf; theſe reproaches, however, are entirely groundleſs: it were to be wiſhed, that the accuſations which gardeners bring againſt the Earwig were as ſlightly founded. At length the wings of this animal burſt from their confinement, and when it becomes a winged inſect it flies in purſuit of the female, ceaſing to feed, and is wholly employed in the buſineſs of propagation. After having lived a few days in its winged ſtate, and taken care for the continuance of poſterity, it dries up and expires.

To this order of inſects belong the Cuckow-Spit or Froth-Worm, that is often found in the frothy matter on the ſurface of plants. The Water Tipula, the common Water Fly may be claſſed in the ſame order. To theſe may be added the Water Scorpion, which is near an inch in length, and half an inch in breadth. The Water Scorpion lives in the water by day, out of which they riſe into the air in the duſk of the evening, and often betake themſelves to other waters in queſt of food.

NATURAL HISTORY of the EPHEMERA.

THERE are ſeveral kinds of Ephemeras, which are of various colours, as brown, yellow, and cream-coloured. It appears ſurprizing that there ſhould be a tribe of flies whoſe duration extends but to a day; but ſome of this kind ſeem to be born and to die in a much ſhorter time: the reptile, however, from which they are bred, are ſometimes known to live two or three years. They are produced from the egg in the form of worms, from whence they change into the form of aurelias; and from thence they take their laſt mutation, which is into a beautiful fly, of a ſhorter or longer duration, according to its kind. In its fly ſtate, it is a beautiful winged inſect, and ſtrongly reſembles the butterfly. But though the uſual date of theſe flies is five or ſix hours, there are ſome kinds that live ſeveral days.

NATURAL HISTORY of the CATERPILLAR, BUTTERFLY, and MOTH.

CATERPILLARS are readily diſtinguiſhed from worms or maggots by the number of their feet, and by their producing Butterflies or Moths.

WINGED INSECTS.

FLIES

The Breeze or Gad Fly

The Gray or Trumpet Fly

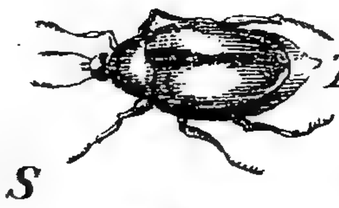
Œstrus Sp.7

Œstrus Sp.5.

The Wasp Fly

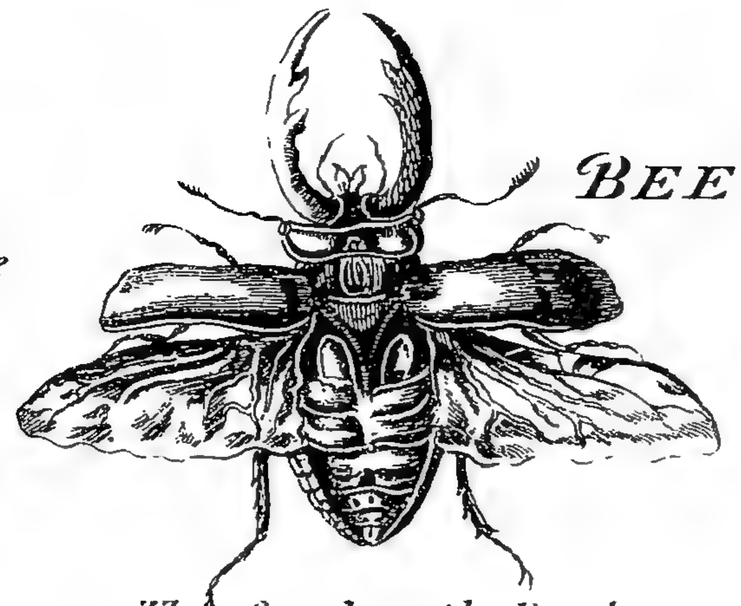
The Hornet Fly

The little Oval Beetle

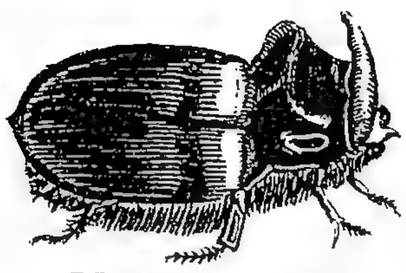


The Brass Beetle

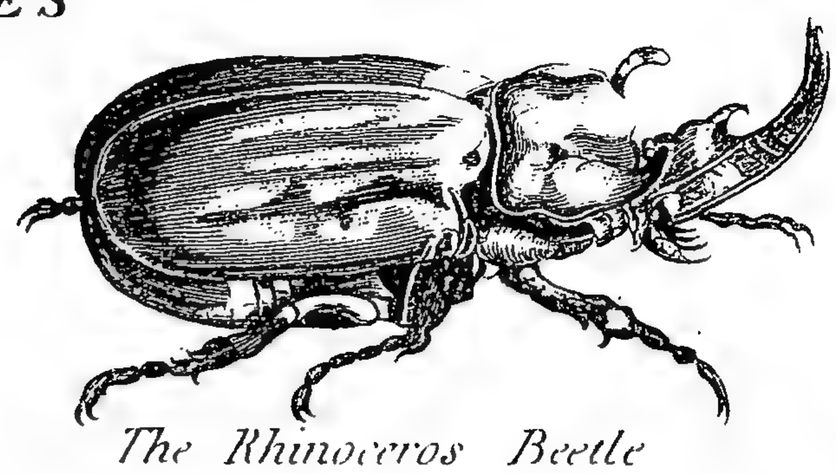
BEETLES



The Staghorn'd Beetle

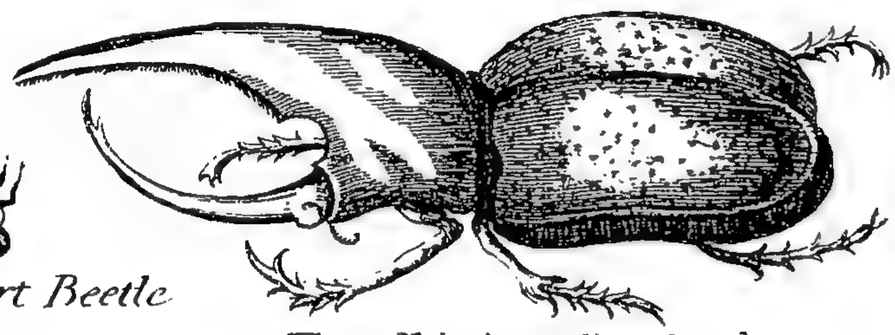


The Unicorn Beetle

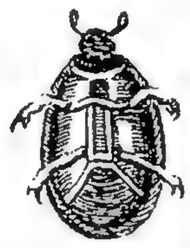


The Rhinoceros Beetle

The Sawwort Beetle



The Shining Beetle Sp.3.



Dermestes Sp.1.

Dermestes Sp.11.

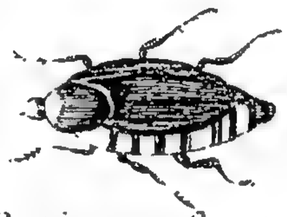
Cassida Sp.3.

The Green Tortoise Beetle

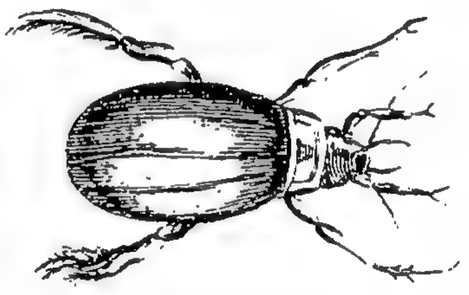
Cassida Sp.2.

Cerambyx Sp.7.

Cerambyx Sp.8.



Dytiscus Sp.5



The great Water Beetle

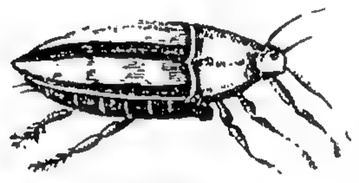
Mordella Sp.1.

Mordella Sp.2.

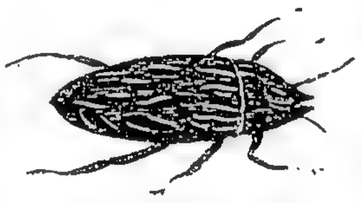
Cicindela Sp.1.

Cicindela Sp.5.

Buprestis Sp.2.



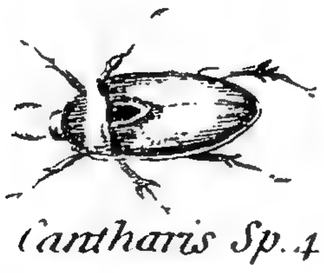
Dytiscus Sp.2.



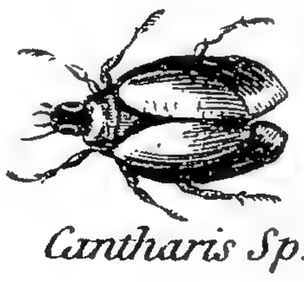
Dytiscus Sp.6.

Elater Sp.2.

Elater Sp.6.



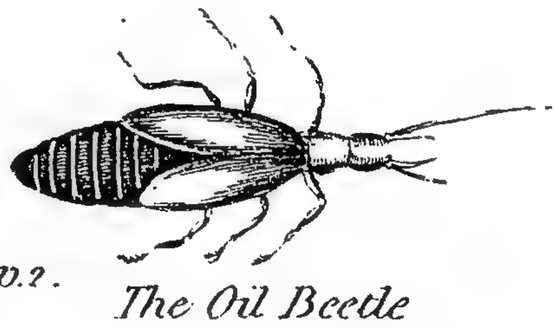
Cantharis Sp.4.



Cantharis Sp.5.

The Mill Beetle

Necydalis Sp.2.



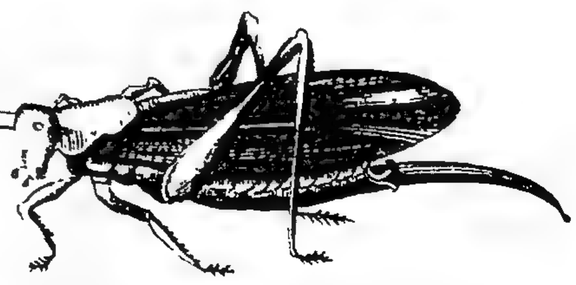
The Oil Beetle

LOCUSTS

Staphylinus Sp.3.

The Mole Cricket

The Spanish Locust



The great Green Locust

The Long-bodied Mantis

The Common Mantis

The House Cricket

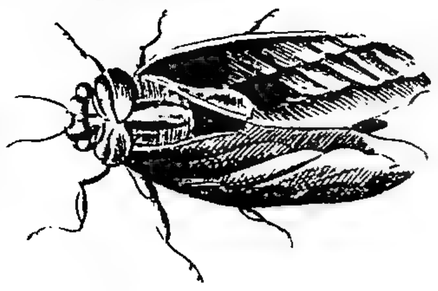
The Field Cricket

London, Publish'd as the Act directs, by Alex.r Hogg, N.o 16. Paternoster Row.

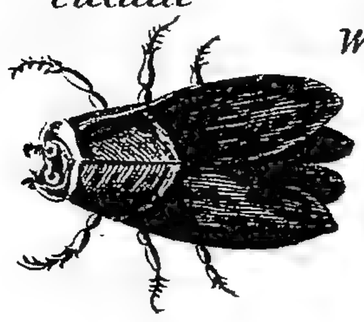
Royce sculp.

WINGED INSECTS

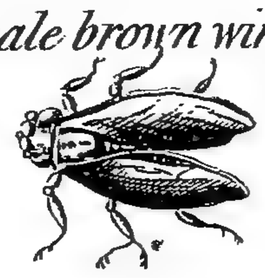
The common Italian Cicada



The lesser Italian Cicada

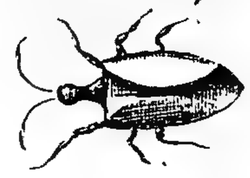


The little Cicada with pale brown wings



The American Laternaria or yellow compress'd Cicada

Cimex Sp.1.



Cimex Sp.5.

Cimex Sp.3.

Cimex Sp.11.

Cimex Sp.7.

Cimex Sp.8.

Cimex Sp.9.

Cimex Sp.2.

Cimex Sp.4.

Cimex Sp.3.

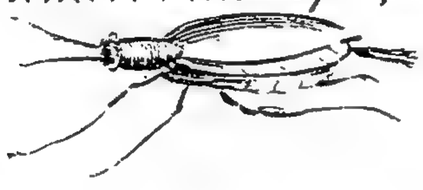
Notonecta the Boat Fly

Water Scorpions

The Scorpion Fly

The Sharp tail'd Fly

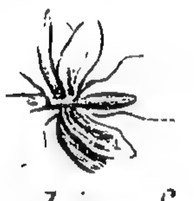
Hemerobius Sp. 1.



Phryganea Sp.1.

Phryganea Sp.1.

Hermerobius Sp.1.



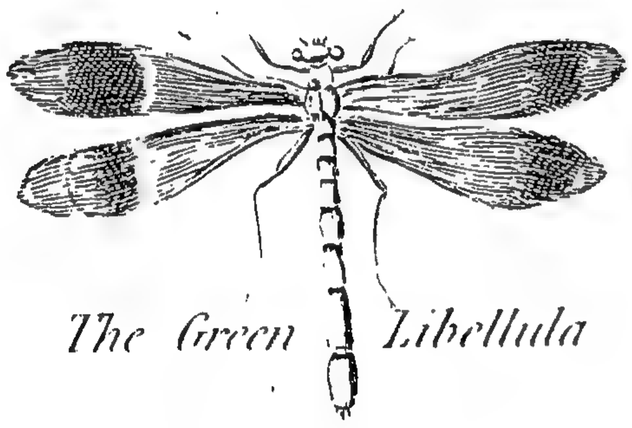
Ephemera Sp.1.

Ephemera

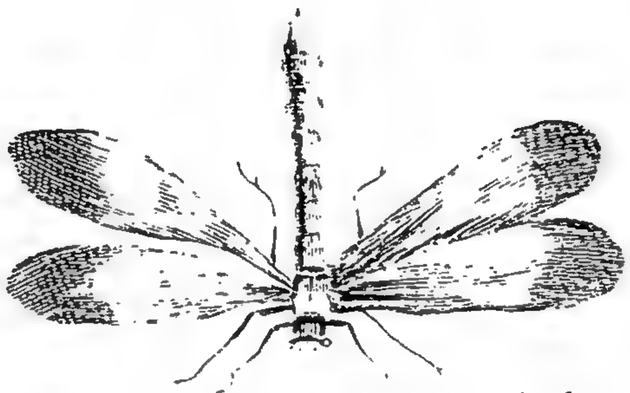
Ephemerea Sp.1.

Ephemera

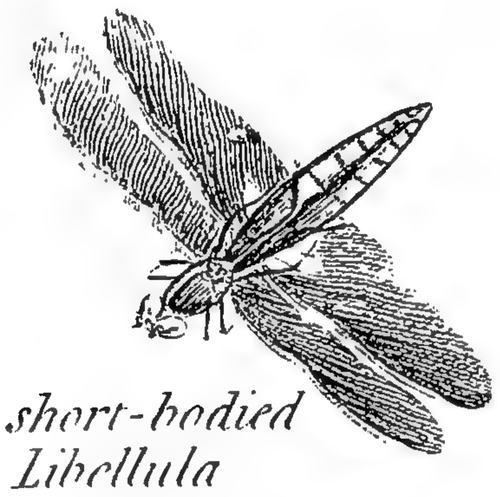
Phryganea Sp.1.



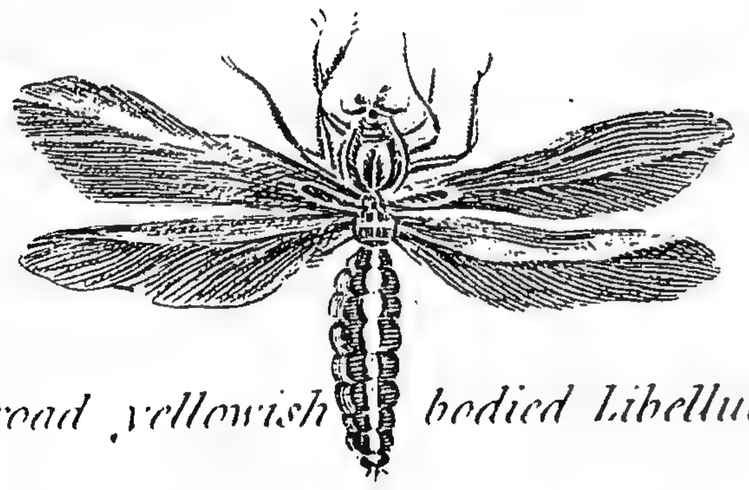
The Green Libellula



The red-bodied Libellula

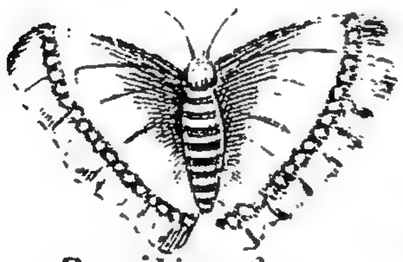


The short-bodied Libellula

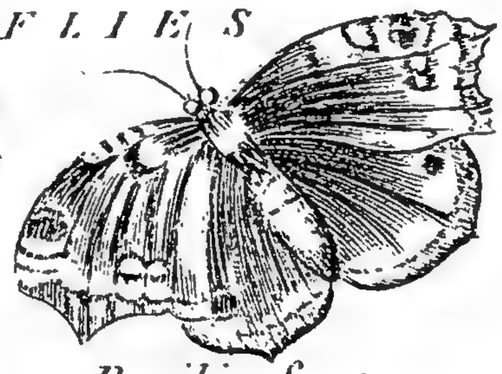


The broad yellowish bodied Libellula

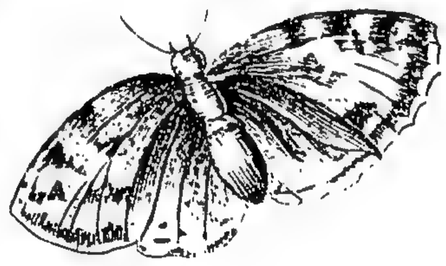
BUTTERFLIES



Papilio Sp.11.

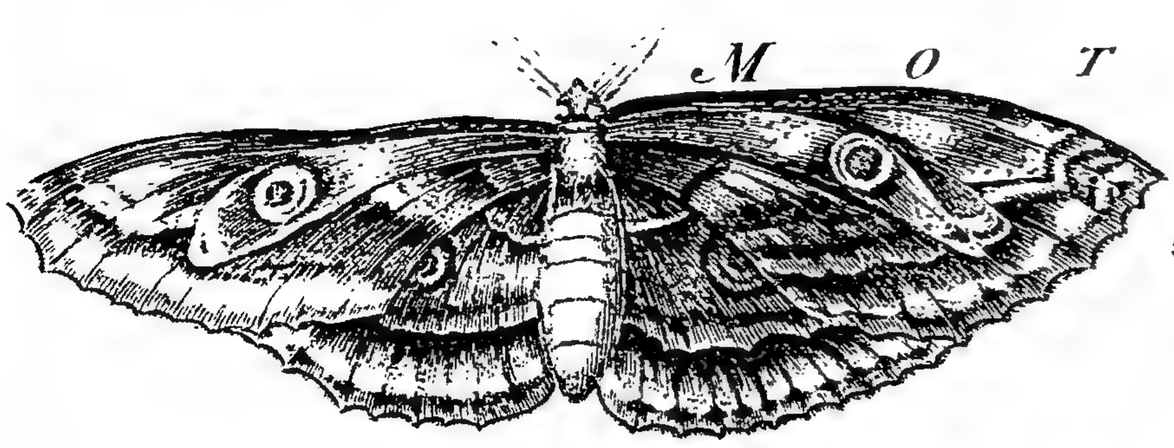


Papilio Sp.2.

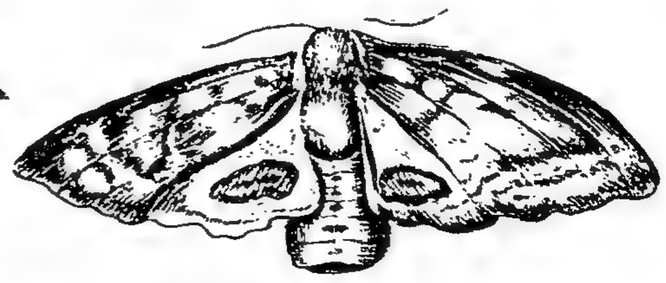


Papilio Sp.9.

MOTHS



Phalæna Sp.6.



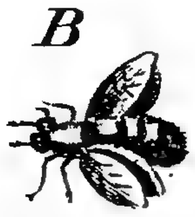
Phalæna Sp.10.

Phalæna Sp.11.

BEES

Tenthredo Sp.9.

The Yellow Ichneumon Fly



The Green & Yellow Bee

Apis Sp.18.

Apis Sp13.

The Great Humble Bee

Formica Sp.5.

Royce sculp.

London. Publish'd by Alex.r Hogg, at the Kings Arms. No.16, Paternoster Row.

Moths. All this claſs have from eight to ſixteen feet; and the animal into which they are converted is always a Butterfly or a Moth. It is well known, that all theſe little animals are hatched from the eggs of Butterflies, and, during winter, the greateſt number of Caterpillars are in an egg ſtate. When it has ſtrength to break its ſhell, it always finds its favourite aliments provided in abundance before it.

The body of a Caterpillar is compoſed of rings, which are generally twelve in number; by which they may be diſtinguiſhed from any other inſects that reſemble them. The head is connected to the firſt ring by the neck: the jaws are placed rather vertically, and each jaw is armed with a large thick tooth. With theſe the animals devour their food in amazing quantities. A ſingle Caterpillar will eat double its own weight of leaves in a day, without appearing to be diſordered by the meal.

With regard to their external figure, Caterpillars are either ſmooth or hairy; they have in general ſix ſmall black ſpots on the circumference of the fore ring; three of which are larger than the reſt, which Reaumur ſuppoſes to be eyes. This inſect has nine holes on each ſide of the body, through which it is ſuppoſed to breathe; they are called the ſtigmata.

The life of the Caterpillar ſeems to be one continued ſucceſſion of changes, and, before the great metamorphoſis, changes its ſkin eight or ten times. At length it becomes an aurelia; and one would imagine, that they were conſcious of the preciſe time of their continuance in their aurelia ſtate; their little ſepulchres, with reſpect to their ſolidity, being proportioned to ſuch duration. At length the Butterfly burſts from its aurelia ſkin, and decorates our fields with its ſymmetry and beauty.

The number of Butterflies is very great: Linnæus has reckoned up above ſeven hundred and ſixty different kinds, and the catalogue is ſtill very incomplete. Thoſe of the warmer climates, however, are larger and more beautiful than ſuch as are bred at home.

It is not by day alone that theſe animals are ſeen fluttering wantonly from flower to flower, as the greateſt number of them fly by night, and expand the moſt beautiful colouring, at thoſe hours when there is no ſpectator. They are therefore divided into diurnal and nocturnal flies; or Butterflies and Moths. They may be readily diſtinguiſhed from each other by their horns or feelers: thoſe of the Butterfly being clubbed or knobbed at the end: and thoſe of the Moth tapering finer and finer to a point. The female Moth lays its eggs ſoon after it leaves the aurelia, but many of the Butterflies do not think of providing for poſterity till the ſummer is far advanced.

Natural History of the SILKWORM.

THIS little animal, which only works for itſelf, has been of infinite ſervice to the human race, and furniſhes them with a more beautiful covering than can be ſupplied by any other animal. It is imagined, that Silkworms were not brought into Europe till the beginning of the twelfth century; when Roger of Sicily brought ſome manufacturers in ſilk from Aſia Minor, on his return from his expedition to the Holy Land, and ſettled them in Sicily and Calabria. From theſe this manufacture was taught to the other kingdoms of Europe.

The Silkworm is a large caterpillar of a whitiſh colour, with twelve feet, and is afterwards transformed into a butterfly of the moth kind. The cone on which it ſpins, is formed for covering it while it remains in the aurelia ſtate; and ſeveral of theſe, when properly wound off, and united together, form thoſe ſtrong and beautiful threads, which are woven into ſilk: and, as our luxuries are increaſed, the ſilk manufacture is become one of the moſt lucrative of any in the ſouthern provinces of Europe.

Previous to ſpinning its web, the Silkworm ſeeks for a convenient place to erect its cell, without any obſtruction. Having found a leaf, or a chink fitted to its purpoſe, it begins to writhe its head in every direction; and faſtens its thread on every ſide to the ſides of its retreat.

In the courſe of a fortnight or three weeks the aurelia is changed into a moth: no ſooner is the winged inſect completely formed, than having diveſted itſelf of its aurelia ſkin, it prepares to burſt through its cone, or outward priſon, and by repeated efforts becomes emancipated. This animal, in its fly ſtate, ſeems produced for no other purpoſe than to tranſmit a future brood. It neither flies nor eats; the male only ſeeking the female; their union continues for about four days without interruption; the male then dies, and the female ſurvives him only till ſhe has laid her eggs; which in the enſuing ſpring, are hatched into worms.

Natural History of the BEE.

THE Bee is a ſmall and well known inſect, famous for its induſtry.

This uſeful and laborious inſect is divided by two ligaments into three parts or portions, the head, the breaſt, and the belly. The head is armed with two jaws and a trunk; the former of which play like two jaws opening and ſhutting to the right and left. The trunk is long and taper, and, at the ſame time, extremely pliant and flexible, being deſtined by nature for the inſect to probe to the bottom of the flowers, through all the impediments of their chives and foliage; and drain them of their treaſured ſweets: but were this trunk to be always extended, it would prove incommodious, and be liable to be injured by a thouſand accidents, it is therefore of ſuch a ſtructure, that, after the performance of its neceſſary functions, it may be contracted, or rather folded up; and beſides this, it is fortified againſt all injuries by four ſtrong ſcales, two of which cloſely ſheathe it, and the two others, whoſe cavities and dimenſions are larger, encompaſs the whole. From the middle part or breaſt of the Bee grow the legs, which are ſix in number: and at the extremity of the paws are two little hooks, diſcernible by the microſcope, which appear like ſickles, with their points oppoſite to each other. The wings are four, two greater and two ſmaller, which not only ſerve to tranſport them through the air, but, by the noiſe they make, to give notice of their departure and arrival, and to animate them mutually to their ſeveral labours. The hairs with which the whole body is covered, are of ſingular uſe in retaining the ſmall duſt that falls from the chives of the flowers, of which the wax is formed. The belly of the Bee conſiſts of ſix rings, which ſlide over one another, and may be lengthened or contracted at pleaſure; and the inſide of this part of the body contains the inteſtines, the bag of honey, the bag of poiſon, and the ſting. The office of the inteſtines is the ſame as in other animals. The bag of honey is tranſparent as cryſtal, containing the ſweet juices extracted from flowers, which the Bee diſcharges into the cells of the magazine for the ſupport of the community in winter. The bag of poiſon hangs at the root of the ſting, through the cavity of which, as through a pipe, the Bee ejects ſome drops of this venomous liquor into the wound, and ſo renders the pain more exceſſive. The mechaniſm of the ſting is admirable, being compoſed of two darts, encloſed within

within a ſheath that tapers into a fine point, near which is an opening to let out the poiſon. The two darts are ejected through another aperture, which, being armed with ſeveral ſharp beards like thoſe of fiſh-hooks, are not eaſily drawn back again by the Bee; and indeed ſhe never diſengages them, if the wounded party happens to ſtart and put her into confuſion; but if one can have patience to continue calm and unmoved, ſhe clinches thoſe lateral points round the ſhaft of the dart, by which means ſhe recovers her weapons, and gives leſs pain to the perſon ſtung. The liquor which at the ſame time ſhe infuſes into the wound, cauſes a fermentation, attended with a ſwelling, which continues ſeveral days; but that may be prevented by immediately pulling out the ſting, and enlarging the puncture, to let the venomous matter have room to eſcape.

Let us now conſider the generation, polity, and labours of theſe inſects, the true knowledge of which is very much owing to the modern invention of glaſs hives, through which all the ſecrets of the community are laid open to a curious obſerver. Any perſon who carefully examines a hive at different ſeaſons of the year will diſtinguiſh three ſorts of Bees; of which the far greater number are the common working Bees, who do all the buſineſs of the hive, and ſeem to be neither male nor female. The working Bee. The ſecond ſort, called drones, are the males, and ſomewhat larger than the former; they have no ſting, nor ever ſtir from the hive, but live upon the honey prepared by the others. The third ſort is a much larger and longer bodied Bee, of which there are often but one in every ſwarm or colony of young Bees, who are from time to time detached from the hive in ſearch of another habitation. This large Bee is what the ancients called the king, from the reſpect they always ſaw paid to it by the other Bees; but being the female, the moderns more properly give the title of queen, or mother of the ſwarm.

When theſe induſtrious inſects begin their works, it is obſerved they are divided into four parties, one of which is deſtined to the fields to provide materials for the ſtructure; the ſecond works upon thoſe materials, and forms them into a rough ſketch of the dimenſions and partitions of the cells; the third examines and adjuſts the angles, removes the ſuperfluous wax, poliſhes the work, and gives it its neceſſary perfection; and the fourth is employed in bringing proviſions to the labourers that build them, becauſe poliſhing is not ſo laborious. They begin their work at the top of the hive, continuing downwards to the bottom, and from one ſide to another; and to make it the more ſolid, they uſe a ſort of tempered wax, reſembling glue. The form of the cells of the honey-comb is hexagonal, which figure, beſides what is common with a ſquare and equilateral triangle, has the advantage of including a greater ſpace within the ſame ſurface.

The expedition of the Bees in their labour, is almoſt incredible; for notwithſtanding the elegance and juſt proportions of the work, they are ſo indefatigable, that they will, in one day, finiſh a honey-comb a foot long, and ſix inches broad, capable of receiving three thouſand bees.

When the cells are completed, the queen takes poſſeſſion of thoſe ſhe likes beſt to depoſit her eggs in, and the reſt are left to be filled with honey. She lays one egg in each cell, and ſometimes more than an hundred of thoſe eggs in a day; but what is ſtill more remarkable, ſhe lays thoſe eggs which are to produce common Bees, in cells of the common ſhape and ſize; thoſe that are to become drones or males, in the cells of a larger ſize; and depoſits thoſe which are to become females, like herſelf, in the ſpheroidical cells already deſcribed.

Theſe eggs, after lying ſome time in the cells, are hatched into maggots, and fed with honey ten or twelve days, after which, the other bees cloſe up the cells with a thin piece of wax; and under this covering they become gradually transformed into Bees, in the manner as ſilk-worms are into butterflies. Having undergone this change, the young Bees pierce through their waxen doors, wipe off the humidity from their little wings, take their flight into the fields, rob the flowers of their ſweets, and are perfectly acquainted with every neceſſary circumſtance of their future conduct. As to the males or drones, which are deſtined only to propagate their ſpecies, they live very comfortably for about three months after they are hatched; but when that time is over, and the females are impregnated, the common Bees either kill them, or drive them from the hive, as burthenſome to the community, and not a drone is to be found till the next ſeaſon.

It is an excellent obſervation of a modern author, that the hive is a ſchool to which numbers of people ought to be ſent; prudence, induſtry, benevolence, public ſpiritedneſs, œconomy, neatneſs, and temperence, are all viſible among the Bees. Theſe little animals are actuated by a ſocial ſpirit, which forms them into a body politic, intimately united, and perfectly happy. They all labour for the general advantage; they are all ſubmiſſive to the laws and regulations of the community: having no particular intereſt, no diſtinction but thoſe which nature or the neceſſities of their young have introduced amongſt them. They are free, becauſe they only depend on the laws; they are happy, becauſe the concurrence of their ſeveral labours inevitably produces abundance, which contributes to the riches of each individual. Let us compare human ſocieties with this, and they will appear altogether monſtrous. Neceſſity, reaſon, and philoſophy, have eſtabliſhed them for the commendable purpoſes of mutual aid and benefits: but a ſpirit of ſelfiſhneſs deſtroys all; and one half of mankind, to load themſelves with ſuperfluities, leave the other deſtitute of common neceſſaries.

When the hive is become too much crowded, by the addition of the young brood, a part of the Bees think of finding themſelves a more commodious habitation, and with that view ſingle out the moſt forward of the young queens. A new ſwarm is, therefore, conſtantly compoſed of one queen at leaſt, and of ſeveral thouſand working Bees, as well as of ſome hundreds of drones. The working Bees are ſome old, ſome young.

The uſual method of uniting ſwarms is very eaſy. Spread a cloth at night upon the ground cloſe to the hive in which the two caſts or ſwarms are to be united; lay a ſtick acroſs this cloth; then fetch the hive with the new ſwarm, ſet it over the ſtick, give a ſmart ſtroke on the top of the hive, and all the Bees will drop down upon the cloth in a cluſter. This done, throw aſide the empty hive, take the other from off the ſtool, and ſet this laſt over the Bees, who will ſoon aſcend into it, mix with thoſe already there, and become one and the ſame family. Others, inſtead of ſtriking the Bees down upon the cloth, place with its bottom upmoſt the hive in which the united ſwarms are to live, and ſtrike the Bees of the other hive down into it. The former of theſe hives is then reſtored to its natural ſituation, and the Bees of both hives ſoon unite. If ſome Bees ſtill adhere to the other hive, they may be bruſhed off on the cloth, and they will ſoon join their brethren. Or one may take the following method, which gives leſs diſturbance to the Bees. Set with its mouth upmoſt the hive into which the young ſwarm has been put, and ſet upon it the other hive. The Bees in the lower hive, finding themſelves in an inverted ſituation, will ſoon aſcend into the upper.

Columella

Columella directs, that the apiary, or Bee-garden, face the ſouth, in a place neither too hot, nor too much expoſed to the cold; that it be in a valley, in order that the loaded Bees may with the greater eaſe deſcend to their homes; that it be near the manſion-houſe, on account of the conveniency of watching them, but ſo ſituated as not to be expoſed to noiſome ſmells, or to the din of men or cattle; that it may be ſurrounded with a wall, which, however, ſhould not riſe above three feet high; that, if poſſible, a running ſtream be near them, or, if that cannot be, that water be brought near them in troughs, with pebbles or ſmall ſtones in the water, for the Bees to reſt on whilſt they drink; or that the water be confined within gently declining banks, in order that the Bees may have ſafe acceſs to it; they not being able to produce either combs, honey, or food for their maggots, without water. That the neighbourhood of rivers or baſons of water with high banks be avoided, becauſe winds may whirl the Bees into them, and they cannot eaſily get on ſhore from thence to dry themſelves; and that the garden in which the apiary ſtands be well furniſhed with ſuch plants as afford the Bees plenty of good paſture. The trees in this garden ſhould be of the dwarf kind, and their heads buſhy, in order that the ſwarms which ſettle on them may be the more eaſily hived.

We come now to explain the moſt inhuman method commonly practiſed of taking Bees, which conſiſts in wantonly deſtroying the whole ſwarm, in order to enjoy the fruits of their labours.

Were we to kill the hen for her egg, the cow for her milk, or the ſheep for the fleece it bears, every one would inſtantly ſee how much we ſhould act contrary to our own intereſt: and yet this is practiſed every year in regard to Bees. Would it not argue more wiſdom in us to be contented with taking away only a portion of their wax and honey, as is the practice of many countries? The common method here is, that when thoſe which are doomed for ſlaughter have been marked out (which is generally done in September) a hole is dug near the hive, and a ſtick, at the end of which is a rag that has been dipped in melted brimſtone, being ſtuck in that hole, the rag is ſet on fire, the hive is immediately ſet over it, and the earth is inſtantly thrown up all around, ſo that none of the ſmoke can eſcape. In a quarter of an hour, all the Bees are ſeemingly dead; and they will ſoon after be irrecoverably ſo, by being buried in the earth that is returned back into the hole: they will ſoon be abſolutely killed by this laſt means; becauſe it has been found, by experiment, that all the Bees which have been affected only by the fumes of the brimſtone, recover again, excepting ſuch as have been ſinged or hurt by the flame. Hence it is evident, that the fume of brimſtone might be uſed for intoxicating the Bees, with ſome few precautions. The heavieſt and the lighteſt hives are alike treated in this manner; the former, becauſe they yield the moſt profit, with an immediate return; and the latter, becauſe they would not be able to ſurvive the winter. Thoſe hives which weigh from fifteen to twenty pounds, are thought to be the fitteſt for keeping.

The practice of the ancients was, however, very different from this: they were content to ſhare with theſe induſtrious inſects the produce of their labours; and ſome very laudable attempts have been made in our own country, to attain the deſirable end of getting the honey and wax, without deſtroying the Bees. John Geddy, Eſq. publiſhed in the year 1665, his invention of boxes for preſerving the lives of Bees. Theſe were improved by Joſeph Warder, phyſician, at Croydon, who at the ſame time embelliſhed his account of the ſtructure and uſe of theſe boxes, with ſeveral other curious circumſtances concerning Bees, in his work, intitled, The True Amazons, or the Monarchy of Bees. Two very worthy clergymen, the Rev. Mr. John Thorley, of Oxford, and the Rev. Mr. Stephen White, M. A. Rector of Holton, in Suffolk, have brought the method of preſerving the lives of Bees to ſtill greater perfection.

The indefatigable Mr. Wildman, ſo univerſally known for his curious experiments with Bees, has obliged the world with the following method of taking the wax and honey, without deſtroying the Bees:

Remove, ſays he, the hive from which you would take the wax and honey, into a room, into which admit but little light, that it may at firſt appear to the Bees as if it were late in the evening. Gently invert the hive, placing it between the frames of a chair, or other ſteady ſupport, and cover it with an empty hive, keeping the ſide next the window of the empty hive raiſed a little, to give the Bees ſufficient light to get into it. While you hold the empty hive ſteadily ſupported on the edge of the full hive, between your ſide and your left arm, keep ſtriking with your other hand all round the full hive from top to bottom, in themanner of beating a drum, ſo that the Bees may be frightened by the continual noiſe from all quarters; and they will in conſequence mount out of the full hive into the empty one. Repeat the ſtrokes rather quick than ſtrong round the hive, till all the Bees are got out of it, which will generally be in about five minutes. It is to be obſerved, that the fuller the hive is of Bees, the ſooner they will have left it. As ſoon as a number of them have got into the empty hive, it ſhould be raiſed a little from the full one, that the Bees may not continue to run from the one to the other. As ſoon as all the Bees are out of the full hive, the other, in which the Bees are, muſt be placed on the ſtand from which the former hive was taken, in order to receive the abſent Bees as they return from the fields.

If this be done early in the ſeaſon, the operator ſhould examine the royal cells; for if any of them contain young Bees, they muſt, as well as all the combs that have young Bees in them, be ſaved in the hive. Take out the other combs with a long broad and pliable knife; cutting them from the ſides and crown as clean as poſſible, to ſave the future labours of the Bees, who muſt lick up the honey ſpilt, and remove every grain of wax: the ſides of the hive ſhould then be ſcraped with a table-ſpoon, to clear away what was left by the knife.

Having thus finiſhed taking the wax and honey, let a table covered with a clean cloth, be placed near the ſtand, and giving the hive in which the bees are a ſudden ſhake, ſtriking it at the ſame time pretty forcibly, the Bees will be ſhaken on the cloth. Put their own hive over them immediately, raiſed a little on one ſide, that the Bees may the more eaſily enter, and when all are entered, place it on the ſtand as before. If the hive in which the Bees are, be turned uppermoſt, and their own hive placed over it, the Bees will immediately aſcend into it, eſpecially if the lower ſides be ſtruck to alarm them: for the effects of fear impreſſed on the Bees, by the continual noiſe, renders them for a conſiderable time ſo mild and tractable, that they will bear any handling, which does not hurt them, without any ſhew of reſentment.

NATURAL HISTORY of the WASP and HORNET.

THOUGH the bee and the Waſp reſemble each other very ſtrongly, yet they differ very widely in their manner and duration. The Waſp is well known to be a winged inſect with a ſting: it is longer

longer in proportion than the bee, and is marked with bright yellow circles round the body: it is the ſwifteſt and moſt active inſect of all the fly kind. It has a long tooth on each ſide of the mouth, with which it is enabled to cut almoſt any ſubſtance, and carry it to its neſt.

Like bees, theſe inſects live in community, and ſometimes upwards of ten thouſand are found inhabiting one neſt. Among bees every community is compoſed of females, or queens, drones or males, and neutral or working bees. The occupations of Waſps are ſimilar; the two firſt are for propagating the ſpecies, the laſt for defending and nurſing the riſing progeny. Bees, however, have ſeldom more than a queen or two in an hive; among Waſps there are two or three hundred. The neſt of the Waſp is very curious, the conſtruction of which is not very different from that of the bee; and each cell is hexagonal, like that of the bee.

The Waſps of Europe are very miſchievous, but they are innocent when compared to thoſe of the tropical climates, where all the inſect tribes are not only numerous, but large, voracious, and formidable. In ſome of the iſlands, no precautions can prevent their attacks, and their ſting is ſometimes as terrible as that of a ſcorpion.

The Hornet is about twice as large as the Waſp, but ſtrongly reſembles it in ſhape. It has four wings, thoſe above being double the ſize of thoſe below. It makes a greater noiſe in flying than a Waſp, and is a very troubleſome and dangerous inſect.

Natural History of the ICHNUMON FLY.

THERE are many different kinds of this inſect, but that which is the moſt formidable, is called the common Ichnumon. The body is long, ſlender, and black: the head, breaſt, feelers, and weapon at the tail, are of the ſame colour: it has four wings, like the bee, which are tranſparent, with a black ſpot near the edge of each. The weapon at the tail is longer than the body, and conſiſts of three parts like hairs. Ray calls it the Waſp Ichnumon. This creature is a dreadful enemy to the inſect tribe, but a particular friend to mankind. The millions it deſtroys in a ſummer are inconceivable; and without ſuch a deſtroyer, the fruits of the earth would only furniſh a banquet for the inſect race.

Natural History of the ANT.

THESE inſects are famous from all antiquity for their ſocial and induſtrious habits: they are offered as a pattern of parſimony for the profuſe, and of unremitting diligence to the ſluggard. It is, however, ſurpriſing that all the writers of antiquity ſhould deſcribe this inſect as labouring in the ſummer, and feaſting upon the produce during the winter; it being well known that they require no ſupply of winter proviſions, as they are actually in a ſtate of torpidity during that ſeaſon. But this may not, perhaps, be the caſe in ſome of the warmer climates, where the winter is mild.

The common Ants are of two or three different kinds; ſome are red, others black; ſome have ſtings, others have none. Such as have ſtings, inflict their wounds with them; ſuch as have not, ſpirt from their hinder parts an acid pungent liquor. The body of an Ant is divided into the head, breaſt, and belly. The eyes are black, and under them are two ſmall horns or feelers. The breaſt is covered with a fine ſilky hair, from which project ſix legs, the extremities of each have two ſmall claws. The body is of a brown cheſnut colour, ſomewhat reddiſh about the belly. Like bees, they are divided into males, females, and the neutral or working tribe. The females are larger than the males, and the working Ants are the ſmalleſt of all. The former, in general, have wings, the latter never have any; and upon them are devolved all the labours that tend to the welfare of the community. The males and females mix with the working multitude, but ſeem no way to partake in the common drudgeries of the ſtate.

The fond attachment which the working Ants ſhew to the riſing progeny is amazing: in cold weather they convey them in their mouths to the very depths of their habitation, where they are leſs ſubject to the ſeverity of the ſeaſon. In a fine day they remove them nearer the ſurface, where their maturity may be aſſiſted by the warm beams of the ſun.

The Ants of Africa are of three kinds; the red, the green, and the black; the latter is a very formidable inſect, and above an inch in length. Their ſting produces great pain, and their depredations are ſometimes extremely deſtructive. From their hills, which are from ſix to twelve feet high, they ſally out in a body in queſt of adventures, and ſometimes ſheep, fowls, and even rats, are killed and devoured by theſe mercileſs inſects.

Natural History of the BEETLE.

THERE are various kinds of the Beetle, all concurring in one common formation of having caſes to their wings. Such a covering is the more neceſſary to theſe inſects, as they ſometimes live under the ſurface of the earth, in holes which are made by their own induſtry. The May-bug or dorr-beetle is ſo well known as to require no deſcription. The elephant Beetle is the largeſt of this kind hitherto known; it is found in South-America, particularly Surinam, and about the river Oroonoko. It is black, and the whole body is covered with a hard ſhell. Its length from the hinder part to the eyes, is about four inches. The cantharis is of the Beetle kind, from whence come cantharides, well known by the name of Spaniſh flies, and for their uſe in bliſters. Some are of a pure azure colour, others of pure gold, and others of a mixture of both. They are chiefly natives of Spain, Italy, and Portugal. The cochineal is an inſect of a ſcarlet colour within, and without of a blackiſh red; ſometimes of a white reddiſh or aſh-colour, which are accounted the beſt, and are brought us from Mexico. Theſe inſects are uſed both in dying and in medicine.

Natural History of the GNAT and the TIPULA.

THE Tipula, or long legs, and the larger kind of Gnat, have frequently been miſtaken for each other; they are both mounted on long legs, both furniſhed with two wings and a ſlender body: the principal difference is, that the Tipula wants a trunk, and the Gnat has a large one, which it often exerts to very miſchievous purpoſes; but the Tipula is peaceful and innocent. The Gnat of Europe, indeed, gives but little uneaſineſs; but it is very different in America, where the waters ſtagnate, and the climate is warm, and where they are produced in multitudes beyond expreſſion. There they are found from ſix inches in length to a minuteneſs that requires even the microſcope to perceive them. Tho' the ſuffering inhabitants deſtroy millions daily, ſtill millions more ſucceed, and produce unceaſing torment.

into pieces; and one animal, by the means of cutting, is divided into two diſtinct exiſtencies, and ſometimes into a thouſand. This is the moſt aſtoniſhing phænomenon in all natural hiſtory, that man ſhould have a kind of creative power, and out of one life make two, each completely formed, with all its apparatus and functions. This obtains alſo in the Sea-Worm, the Water-Worm, and in many other of the vermicular ſpecies.

When Des Cartes firſt ſtarted the opinion, that brutes were machines, the diſcovery of this ſurpriſing propagation was unknown, which might, in ſome meaſure, have ſtrengthened his fanciful theory. What is life, in brutes, he might have ſaid, or where does it reſide? In ſome we find it ſo diffuſed, that every part ſeems to maintain a vivacious principle, and the ſame animal appears poſſeſſed of a thouſand diſtinct irrational ſouls at the ſame time. But let us not, he would ſay, give ſo noble a name to ſuch contemptible powers, but rank the vivifying principle in theſe with the ſap that riſes in vegetables, or the moiſture that contracts a cord, or the heat that puts water into motion! Nothing, in fact, deſerves the name of ſoul, but that which reaſons, that which underſtands, and by knowing God, receives the mark of its currency, and is minted with the impreſſion of its great Creator.

Such might have been the ſpeculations of this philoſopher: however, to leave theory, it will be ſufficient to ſay, that we owe the firſt diſcovery of this power of reproduction in animals, to Mr. Trembley, who firſt obſerved it in the polypus; and after him, Spalanzani and others found it taking place in the Earth-Worm, the Sea-Worm, and ſeveral other ill-formed animals of a like kind, which were ſuſceptible of this new mode of propagation. This laſt philoſopher, has tried ſeveral experiments upon the Earth-Worm, many of which ſucceeded according to his expectation; every Earth-Worm, however, did not retain the vivacious principle with the ſame obſtinacy; ſome, when cut in two, were entirely deſtroyed; others ſurvived only in the nobler part; and while the head was living, the tail entirely periſhed, and a new one was ſeen to burgeon from the extremity. But what was moſt ſurpriſing of all, in ſome, particularly in the ſmall red-headed Earth-Worm, both extremities ſurvived the operation; the head produced a tail with the anus, the inteſtines, the annular muſcle, and the prickly beards; the tail part, on the other hand, was ſeen to ſhoot forth the nobler organs, and, in leſs than the ſpace of three months, ſent forth a head, heart, with all the apparatus and inſtruments of generation. This part, as may eaſily be ſuppoſed, was produced much more ſlowly than the former, a new head taking above three or four months for its completion, a new tail being ſhot forth in leſs than as many weeks. Thus two animals, by diſſection, were made out of one, each with their ſeparate appetites, each endued with life and motion, and ſeemingly as perfect as that ſingle animal from whence they derived their origin.

The Sea-Worm, the White Water-Worm, and many of thoſe little Worms with feelers, found at the bottom of dirty ditches; in all theſe, the nobler organs are of ſuch little uſe, that if taken away, the animal does not ſeem to feel the want of them; it lives in all its parts, and in every part, and by a ſtrange paradox in nature, the moſt uſeleſs and contemptible life, is of all others the moſt difficult to deſtroy.

As Worms, like ſerpents, have a creeping motion, ſo both, in general, go under the common appellation of reptiles; a loathſome, noxious, malignant tribe, to which man by nature, as well as by religion, has the ſtrongeſt antipathy. But though Worms, as well as ſerpents, are moſtly without feet, and have been doomed to creep along the earth on their bellies, yet their motions are very different. The ſerpent having a back-bone, which it is incapable of contracting, bends its body into the form of a bow, and then ſhoots forward from the tail; but it is very different with the Worm, which has a power of contracting or lengthening itſelf at will. There is a ſpiral muſcle, that runs round its whole body, from the head to the tail, ſomewhat reſembling a wire wound round a walking-cane, which, when ſlipped off, and one end extended and held faſt, will bring the other nearer to it; in this manner the Earth-Worm, having ſhot out, or extended its body, takes hold by the ſlime of the fore part of its body, and ſo contracts and brings forward the hinder part; in this manner it moves onward, not without great effort, but the occaſions for its progreſſive motion are few.

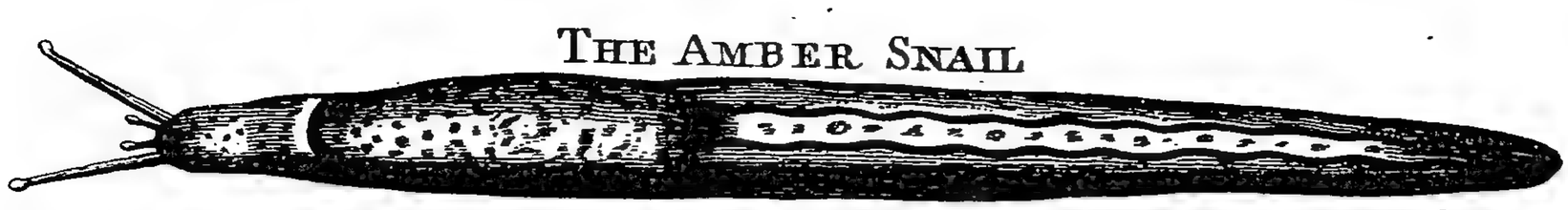
As it is deſigned for living under the earth, and leading a life of obſcurity, ſo it ſeems tolerably adapted to its ſituation. Its body is armed with ſmall ſtiff ſharp burs or prickles, which it can erect or depreſs at pleaſure; under the ſkin there lies a ſlimy juice, to be ejected as occaſion requires, at certain perforations, between the rings of the muſcles, to lubricate its body, and facilitate its paſſage into the earth. It has a mouth, and alſo an alimentary canal, which runs along to the very point of the tail. In ſome Worms, however, particularly ſuch as are found in the bodies of animals, this canal opens towards the middle of the belly, at ſome diſtance from the tail. The inteſtines of the Earth-Worm, are always found filled with a very fine earth, which ſeems to be the only nouriſhment theſe animals are capable of receiving.

The animal is entirely without brain, but near the head is placed the heart, which is ſeen to beat with a very diſtinct motion, and round it are the ſpermatic veſſels, forming a number of little globules, containing a milky fluid, which have an opening into the belly, not far from the head: they are alſo often found to contain a number of eggs, which are laid in the earth, and are hatched in twelve or fourteen days into life, by the genial warmth of their ſituation; like ſnails, all theſe animals unite in themſelves both ſexes at once, the reptile that impregnates, being impregnated in turn; few that walk out, but muſt have obſerved them, with their heads laid againſt each other, and ſo ſtrongly attached, that they ſuffer themſelves to be trod upon.

When the eggs are laid in the earth, which, in about fourteen days, as has been ſaid, are hatched into maturity, the young ones come forth very ſmall, but perfectly formed, and ſuffer no change during their exiſtence: how long their life continues, is not well known, but it certainly holds for more than two or three ſeaſons. During the winter, they bury themſelves deeper in the earth, and ſeem, in ſome meaſure, to ſhare the general torpidity of the inſect tribe. In ſpring, they revive with the reſt of nature, and on thoſe occaſions, a moiſt or dewy evening brings them forth from their retreats, for the univerſal purpoſe of continuing their kind. They chiefly live in a light rich and fertile ſoil, moiſtened by dews or accidental ſhowers, but avoid thoſe places where the water is apt to lie on the ſurface of the earth, or where the clay is too ſtiff for their eaſy progreſſion under ground.

Helpleſs as they are formed, yet they ſeem very vigilant in avoiding thoſe animals that chiefly make them their prey: in particular, the mole, who feeds entirely upon them beneath the ſurface, and who ſeldom ventures, from the dimneſs of its ſight, into the open air; him they avoid, by darting up from the earth, the inſtant they feel the ground move; and fiſhermen, who are well acquainted with this,

NAKED INSECTS.



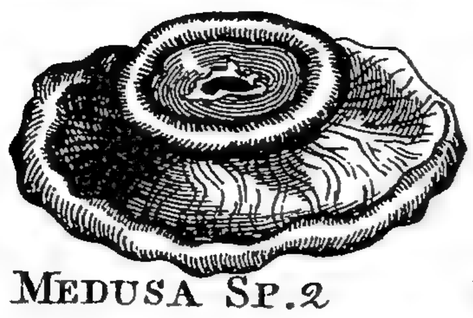
THE AMBER SNAIL

THE RED NAKED SNAIL

THE BLACK NAKED SNAIL

SEA INSECTS

MEDUSA SP.4



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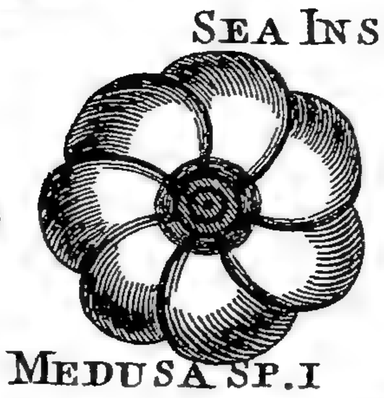

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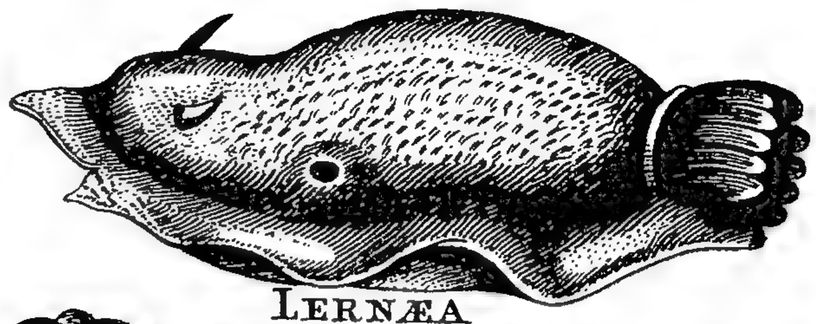

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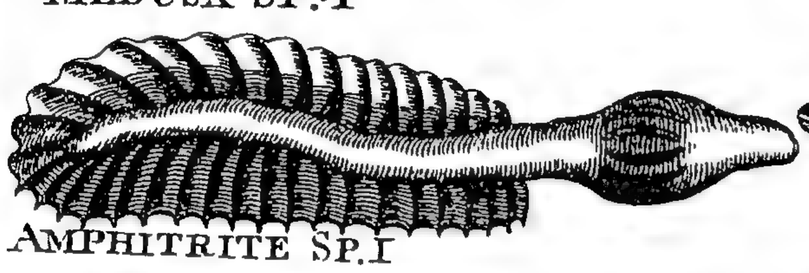


AMPHITRITE SP.1

APHRODITA SP.4

APHRODITA SP.1

AMPHITRITE SP.8

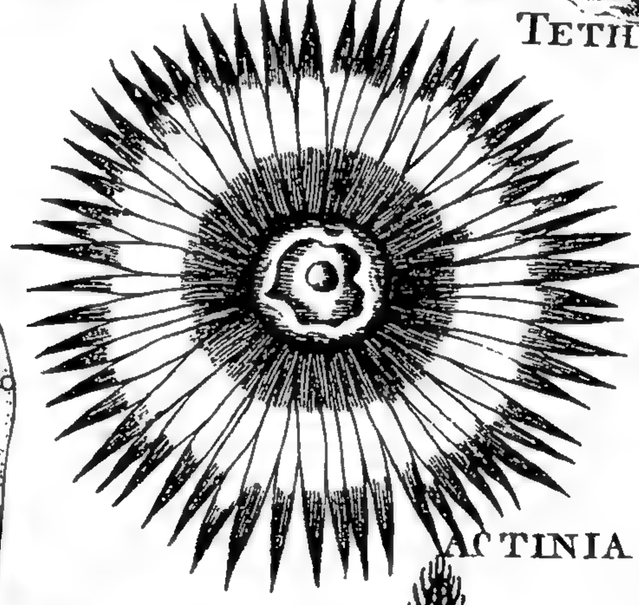
AMPHITRITE SP.3

SALACIA SP.3

NEREIS

TETHYS SP.7

TETHYS SP.2



ACTINIA SP.1

ACTINIA SP.2

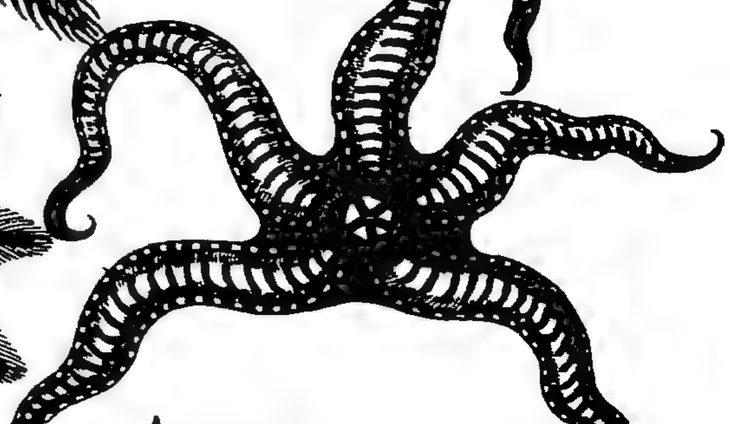
THE CUTTLE FISH

ASTERIAS SP.1

THE FIVE FINGERED STRARFISH

ASTERIAS SP.6

THE SEA COMET



ASTERIAS SP.3

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take them in what numbers they chuſe, by ſtirring the earth where they expect to find them. They are alſo driven from their retreats under ground, by pouring bitter or acid water thereon, ſuch as that water in which green walnuts have been ſteeped, or a lye made of pot-aſhes.

Such is the general outline of the hiſtory of theſe reptiles, which, as it ſhould ſeem, degrades them no way beneath the rank of other animals of the inſect creation; we have mentioned a part of their hiſtory, which proves the imperfection of their organs, from the eaſineſs with which theſe little machines may be damaged and repaired again. It is well known in mechanics, that the fineſt and moſt complicated inſtruments are the moſt eaſily put out of order, and the moſt difficultly ſet right; the ſame alſo obtains in the animal machine. Man, the moſt complicated machine of all others, whoſe nerves are more numerous, and powers of action more various, is moſt eaſily deſtroyed: he is ſeen to die under wounds which a quadruped or a bird could eaſily ſurvive; and as we deſcend gradually to the lower ranks, the ruder the compoſition, the more difficult it is to diſarrange it.

NATURAL HISTORY of the STAR-FISH, the POLIPUS, the CORAL PLANTS, and all the Varieties of the SEA-NETTLE.

NATURALISTS have given to the worm, and all theſe animals, the name of zoophytes. Theſe are not produced by the ordinary forms of generation, but are propagated by diſſection. Some of theſe, as already obſerved, though cut into an hundred parts, ſtill retain life in each; and are endued with ſuch a vivacious principle, that every part becomes a perfect animal in a very ſhort time. They are a ſet of creatures placed between animals and vegetables, and form the ſhade that connects animal and inſenſible nature. Such are the Cuttle-fiſh, the Sea-Star, the Sea-Nettle, and Coral Plants. Numbers of what ſeem plants at ſea, are not only the receptacles of inſects, but alſo entirely of inſect formation. Hence ſome philoſophers have been led into opinion, that all nature was animated, and that the moſt inert maſs of matter was endued with life and ſenſation, and only wanted organs to make thoſe ſenſations perceptible to the beholder.

All of the Star-Fiſh kind are formed of a ſemi-tranſparent gelatinous ſubſtance, covered with a thin membrane, and, to an inattentive ſpectator, often appear like a lump of inanimate jelly, floating at random upon the ſurface of the ſea, or thrown by chance on ſhore at the departure of the tide: but upon a more minute inſpection, they will be found poſſeſſed of life and motion; they will be found to ſhoot forth their arms in every direction, in order to ſeize upon ſuch inſects as are near, and to devour them with great rapacity. Worms, the ſpawn of fiſh, and even muſcles themſelves, with their hard reſiſting ſhell, have been found in the ſtomachs of theſe voracious animals; and what is very extraordinary, though the ſubſtance of their own bodies be almoſt as ſoft as water, yet they are no way injured by ſwallowing theſe ſhells, which are almoſt of a ſtony hardneſs. They increaſe in ſize, as all other animals do. In ſummer, when the water of the ſea is warmed by the heat of the ſun, they float upon the ſurface, and, in the dark, they ſend forth a kind of ſhining light, reſembling that of phoſphorus. Some have given theſe animals the name of Sea-Nettles, becauſe they burn the hands of thoſe that touch them, as nettles are found to do. They are often ſeen faſtened to the rocks, and to the largeſt ſea-ſhells, as if to derive their nouriſhment from them. If they be taken and put into ſpirit of wine, they will continue for many years entire, but if they be left to the influence of the air, they are, in leſs than twenty-four hours, melted down into limpid and offenſive water.

In all of this ſpecies, none are found to poſſeſs a vent for their excrements, but the ſame paſſage by which they devour their food, ſerves for the ejection of their fæces. Theſe animals take ſuch a variety of figures, that it is impoſſible to deſcribe them under one determinate ſhape; but, in general, their bodies reſemble a truncated cone, whoſe baſe is applied to the rock to which they are found uſually attached. Though generally tranſparent, yet they are found of different colours, ſome inclining to green, ſome to red, ſome to white, and ſome to brown. In ſome, their colours appear diffuſed over the whole ſurface; in ſome, they are often ſtreaked, and in others, often ſpotted. They are poſſeſt of a very ſlow progreſſive motion, and in fine weather, they are continually ſeen, ſtretching out and fiſhing for their prey. Many of them are poſſeſt of a number of long ſlender filaments, in which they entangle any ſmall animals they happen to approach, and thus draw them into their enormous ſtomachs, which fill the whole cavity of their bodies. The harder ſhells continue for ſome weeks indigeſted, but at length, they undergo a kind of maceration in the ſtomach, and become a part of the ſubſtance of the animal itſelf. The indigeſtible parts are returned by the ſame aperture by which they were ſwallowed, and then the Star-Fiſh begins to fiſh for more. Theſe alſo may be cut in pieces, and every part will ſurvive the operation; each becoming a perfect animal, endued with its natural rapacity. Of this tribe the number is various, and the deſcription of each would be tedious and uninſtructing; the manners and nature of all, are nearly as deſcribed.

Of all other animals, the Cuttle-fiſh, though in ſome reſpects ſuperior to this tribe, poſſeſſes qualities the moſt extraordinary. It is about two feet long, covered with a very thin ſkin, and its fleſh compoſed of a gelatinous ſubſtance, which, however, within-ſide, is ſtrengthened by a ſtrong bone, of which ſuch great uſe is made by the goldſmith. It is poſſeſſed of eight arms, which it extends, and which are probably of ſervice to it in fiſhing for its prey: while in life, it is capable of lengthening or contracting theſe at pleaſure; but when dead, they contract and loſe their rigidity. They feed upon ſmall fiſh, which they ſeize with their arms; and they are bred from eggs, which are laid upon the weeds along the ſea-ſhore.

The Cuttle-Fiſh is found along many of the coaſts of Europe, but are not eaſily caught, from a contrivance with which they are furniſhed by nature; this is a black ſubſtance, of the colour of ink, which is contained in a bladder generally on the left ſide of the belly, and which is ejected in the manner of an excrement from the anus. Whenever, therefore, this fiſh is purſued, and when it finds a difficulty of eſcaping, it ſpirts forth a great quantity of this black liquor, by which the waters are totally darkened; and then it eſcapes, by lying cloſe at the bottom. In this manner the creature finds its ſafety, and men find ample cauſe for admiration, from the great variety of ſtratagems with which creatures are endued for their peculiar preſervation.

The Polypus lives in freſh water, and is found at the bottom of wet ditches, or attached to the under ſurface of the broad-leafed plants, that grow and ſwim on the waters. The ſame difference holds between theſe and the ſea-water Polypus, as between all the productions of the ſea, and of the land and the ocean. The marine vegetables and animals grow to a monſtrous ſize. The eel, the pike, or the bream, of freſh waters, is but ſmall; but in the ſea they

grow

grow to an enormous magnitude. The herbs of the field, are at moſt but a few feet high; thoſe of the ſea, often ſhoot forth a ſtalk of a hundred. It is ſo between the Polypi of both elements. Thoſe of the ſea, are found from two feet in length, to three or four; and Pliny has even deſcribed one, the arms of which were no leſs than thirty feet long. Thoſe in freſh waters, however, are comparatively minute; at their utmoſt ſize, ſeldom above three parts of an inch long, and when gathered up into their uſual form, not above a third even of thoſe dimenſions.

It was upon theſe minute animals, that the power of diſſection was firſt tried in multiplying their numbers. They had been long conſidered as little worthy the attention of obſervers, and were conſigned to that neglect in which thouſands of minute ſpecies of inſects remain to this very day. It is true, indeed, that Reaumur obſerved, claſſed, and named them. By contemplating their motions, he was enabled diſtinctly to pronounce on their being of the animal, and not of the vegetable kingdom; and he called them Polypi, from their great reſemblance to thoſe larger ones that were found in the ocean. Still, however, their properties were neglected, and their hiſtory unknown.

Mr. Trembley was the perſon to whom we owe the firſt diſcovery of the amazing properties and powers of this little vivacious creature: he divided this claſs of animals into four different kinds; into thoſe inclining to green, thoſe of a browniſh caſt, thoſe of fleſh colour, thoſe which he calls the polype de panache. The differences of ſtructure in theſe, as alſo of colour, are obſervable enough; but the manner of their ſubſiſting, of ſeizing their prey, and of their propagation, is pretty nearly the ſame in all.

Whoever has looked with care into the bottom of a wet ditch, when the water is ſtagnant, and the ſun has been powerful, may remember to have ſeen many little tranſparent lumps of jelly, about the ſize of a pea, and flatted on one ſide; ſuch alſo as have examined the under ſide of the broad-leafed weeds that grow on the ſurface of the water, muſt have obſerved them ſtudded with a number of theſe little jelly-like ſubſtances, which were probably then diſregarded, becauſe their nature and hiſtory was unknown. Theſe little ſubſtances, however, were no other than the living Polypi, gathered up into a quieſcent ſtate, and ſeemingly inanimate, becauſe either undiſturbed, or not excited by the calls of appetite to action. When they are ſeen exerting themſelves, they put on a very different appearance from that when at reſt: to conceive a juſt idea of their figure, we may ſuppoſe the finger of a glove cut off at the bottom; we may ſuppoſe alſo, ſeveral threads or horns planted round the edge like a fringe. The hollow of this finger will give us an idea of the ſtomach of the animal; the threads iſſuing forth from the edges, may be conſidered as the arms or feelers, with which it hunts for its prey. The animal, at its greateſt extent, is ſeldom ſeen above an inch and a half long, but it is much ſhorter when it is contracted and at reſt: it is furniſhed neither with muſcles nor rings, and its manner of lengthening or contracting itſelf, more reſembles that of the ſnail, than worms, or any other inſect. The Polypus contracts itſelf more or leſs, in proportion as it is touched, or as the water is agitated in which they are ſeen. Warmth animates them, and cold benumbs them; but it requires a degree of cold approaching congelation before they are reduced to perfect inactivity; thoſe of an inch have generally their arms double, often thrice as long as their bodies. The arms, where the animal is not diſturbed, and the ſeaſon not unfavourable, are thrown about in various directions, in order to ſeize and entangle its little prey; ſometimes three or four of the arms are thus employed, while the reſt are contracted like the horns of a ſnail, within the animal's body. It ſeems capable of giving what length it pleaſes to theſe arms; it contracts and extends them at pleaſure, and ſtretches them only in proportion to the remoteneſs of the object it would ſeize.

Theſe animals have a progreſſive motion, which is performed by that power they have of lengthening and contracting themſelves at pleaſure; they go from one part of the bottom to another; they mount along the margin of the water, and climb up the ſide of aquatic plants. They are often ſeen to come to the ſurface of the water, where they ſuſpend themſelves by their lower-end. As they advance but very ſlowly, they employ a great deal of time in every action, and bind themſelves very ſtrongly to whatever body they chance to move upon as they proceed; their adheſion is voluntary, and is probably performed in the manner of a cupping-glaſs applied to the body.

All animals of this kind, have a remarkable attachment to turn towards the light, and this naturally might induce an enquirer to look for their eyes; but however carefully this ſearch has been purſued, and however excellent the microſcope with which every part was examined, yet nothing of the appearance of this organ was found over the whole body; and it is moſt probable, that, like ſeveral other inſects which hunt their prey by their feeling, theſe creatures are unfurniſhed with advantages which would be totally uſeleſs for their ſupport.

In the centre of the arms, as was ſaid before, the mouth is placed, which the animal can open and ſhut at pleaſure, and this ſerves at once as a paſſage for food, and an opening for it after digeſtion. The inward part of the animal's body ſeems to be one great ſtomach, which is open at both ends; but the purpoſes which the opening at the bottom ſerves, are hitherto unknown, but certainly not for excluding their excrements, for thoſe are ejected at the aperture by which they are taken in. If the ſurface of the body of this little creature be examined with a microſcope, it will be found ſtudded with a number of warts, as alſo the arms, eſpecially when they are contracted; and theſe tubercles, as we ſhall preſently ſee, anſwer a very important purpoſe.

If we examine their way of living, we ſhall find theſe inſects chiefly ſubſiſting upon others, much leſs than themſelves; particularly a kind of millepedes, that live in the water, and a very ſmall red worm, which they ſeize with great avidity. In ſhort, no inſect whatſoever, leſs than themſelves, ſeems to come amiſs to them: their arms, as was obſerved before, ſerve them as a net would a fiſherman, or perhaps, more exactly ſpeaking, as a lime-twig does a fowler. Wherever their prey is perceived, which the animal effects by its feeling, it is ſufficient to touch the object it would ſeize upon, and it is faſtened without a power of eſcaping. The inſtant one of this inſect's long arms is laid upon a millepede, the little inſect ſticks, without a poſſibility of retreating. The greater the diſtance at which it is touched, the greater is the eaſe with which the Polypus brings the prey to its mouth. If the little object be near, tho' irretrievably caught, it is not without great difficulty that it can be brought to the mouth and ſwallowed. When the Polypus is unſupplied with prey, it teſtifies its hunger by opening its mouth; the aperture, however, is ſo ſmall, that it cannot be eaſily perceived; but when, with any of its long arms, it has ſeized upon its prey, it then opens the mouth diſtinctly enough, and this opening is always in proportion to the ſize of the animal which it would ſwallow; the lips dilate inſenſibly by ſmall degrees, and adjuſt themſelves

ſelves preciſely to the figure of their prey. Mr. Trembley, who took a pleaſure in feeding this uſeleſs brood, found that they could devour aliments of every kind, fiſh and fleſh, as well as inſects; but he owns they did not thrive ſo well upon beef and veal, as upon the little worms of their own providing. When he gave one of theſe famiſhed reptiles any ſubſtance which was improper to ſerve for aliment, at firſt it ſeized the prey with avidity, but after keeping it ſome time entangled near the mouth, it let it drop again with diſtinguiſhing nicety.

When ſeveral Polypi happen to fall upon the ſame worm, they diſpute their common prey with each other. Two of them are often ſeen ſeizing the ſame worm at different ends, and dragging it at oppoſite directions with great force. It often happens, that while one is ſwallowing its reſpective end, the other is alſo employed in the ſame manner, and thus they continue ſwallowing each his part, until their mouths meet together; they then reſt, each for ſome time in this ſituation, till the worm breaks between them, and each goes off with his ſhare; but it often happens, that a ſeemingly more dangerous combat enſues, when the mouths of both are thus joined upon one common prey together: the largeſt Polypus then gapes and ſwallows his antagoniſt; but what is very wonderful, the animal thus ſwallowed ſeems to be rather a gainer by the misfortune. After it has lain in the conqueror's body for about an hour, it iſſues unhurt, and often in poſſeſſion of the prey which had been the original cauſe of contention: how happy would it be for men, if they had as little to fear from each other!

Theſe reptiles continue eating the whole year, except when the cold approaches to congelation; and then, like moſt others of the inſect tribe, they feel the general torpor of nature, and all their faculties are for two or three months ſuſpended; but if they abſtain at one time, they are equally voracious at another, and like ſnakes, ants, and other animals that are torpid in winter, the meal of one day ſuffices them for ſeveral months together. In general, however, they devour more largely in proportion to their ſize, and their growth is quick exactly as they are fed; ſuch as are beſt ſupplied, ſooneſt acquire their largeſt ſize, but they diminiſh alſo in their growth, with the ſame facility, if their food be taken away.

Such are the more obvious properties of theſe little animals, but the moſt wonderful ſtill remain behind: Their manner of propagation, or rather multiplication, has for ſome years been the aſtoniſhment of all the learned of Europe. They are produced in as great a variety of manners as every ſpecies of vegetable. Some Polypi are propagated from eggs, as plants are from their ſeed; ſome are produced by buds iſſuing from their bodies, as plants are produced by inoculation, while all may be multiplied by cuttings, and this to a degree of minuteneſs, that exceeds even philoſophical perſeverance.

With reſpect to ſuch of this kind as are hatched from the egg, little curious can be added, as it is a method of propagation ſo common to all the tribes of inſect nature; but with regard to ſuch as are produced like buds from their parent ſtem, or like cuttings from an original root, their hiſtory requires a more detailed explanation. If a Polypus be carefully obſerved in ſummer, when theſe animals are chiefly active, and more particularly prepared for propagation, it will be found to burgeon forth from different parts of its body, ſeveral tubercles or little knobs, which grow larger and larger every day; after two or three days inſpection, what at firſt appeared but a ſmall excreſcence, takes the figure of a ſmall animal, entirely reſembling its parent, furniſhed with feelers, a mouth, and all the apparatus for ſeizing and digeſting its prey. This little creature every day becomes larger, like the parent, to which it continues attached; it ſpreads its arms, to ſeize upon whatever inſect is proper for aliment, and devours it for its own particular benefit; thus it is poſſeſſed of two ſources of nouriſhment, that which it receives from the parent by the tail, and that which it receives from its own induſtry by the mouth. The food which theſe animals receive, often tinctures the whole body, and upon this occaſion the parent is often ſeen communicating a part of its own fluids to that of its progeny that grows upon it; while, on the contrary, it never receives any tincture from any ſubſtance that is caught and ſwallowed by its young. If the parent ſwallows a red form, which gives a tincture to all its fluids, the young one partakes of the parental colour; but if the latter ſhould ſeize upon the ſame prey, the parent Polypus is no way benefited by the capture, but all the advantage remains with the young one.

But we are not to ſuppoſe that the parent is capable of producing only one at a time, ſeveral young ones are thus ſeen at once, of different ſizes, growing from its body, ſome juſt budding forth, others acquiring their perfect form, and others come to ſufficient maturity, and juſt ready to drop from the original ſtem, to which they had been attached for ſeveral days. But what is more extraordinary ſtill, theſe young ones themſelves, that continue attached to their parent, are ſeen to burgeon, and propagate their own young ones alſo, each holding the ſame dependence upon its reſpective parents, and poſſeſſed of the ſame advantages that have been already deſcribed in the firſt connection. Thus we ſee a ſurpriſing chain of exiſtence continued, and numbers of animals naturally produced without any union of the ſexes, or other previous diſpoſition of nature.

This ſeems to be the moſt natural way by which theſe inſects are multiplied; their production from the egg being not ſo common; and though ſome of this kind are found with a little bladder attached to their bodies, which is ſuppoſed to be filled with eggs, which afterwards come to maturity, yet the artificial method of propagating theſe animals, is much more expeditious, and equally certain: it is indifferent whether one of them be cut into ten, or ten hundred parts, each becomes as perfect an animal, as that which was originally divided: but it muſt be obſerved, that the ſmaller the part which is thus ſeparated from the reſt, the longer it will be in coming to maturity, or in aſſuming its perfect form. It would be endleſs to recount the many experiments that have been tried upon this philoſophical prodigy; the animal has been twiſted and turned into all manner of ſhapes; it has been turned inſide out; it has been cut in every diviſion, yet ſtill it continued to move; its parts adapted themſelves again to each other, and in a ſhort time it became as voracious and induſtrious as before.

Beſides theſe kinds mentioned by Mr. Trembley, there are various others which have been lately diſcovered by the vigilance of ſucceeding obſervers, and ſome of theſe ſo ſtrongly reſemble a flowering vegetable in their forms, that they have been miſtaken by many naturaliſts for ſuch. Mr. Hughes, the author of the Natural Hiſtory of Barbadoes, has deſcribed a ſpecies of this animal, but has miſtaken its nature, and called it a ſenſitive flowering plant; he obſerved it to take refuge in the holes of rocks, and when undiſturbed, to ſpread forth a number of ramifications, each terminated by a flowery petal, which ſhrunk at the approach of the hand, and withdrew into the hole from whence before it had been ſeen to iſſue. This plant, however, was no other than an animal of the Polypus kind, which is not only to be found in Barbadoes, but alſo on many

parts of the coaſt of Cornwall, and along the ſhores of the Continent.

NATURAL HISTORY of LITHOPHYTES and SPONGES.

IT is very probable that the animals we ſee, and are acquainted with, bear no manner of proportion to thoſe that are concealed from us. Athough every leaf and vegetable ſwarms with animals upon land, yet at ſea, they are ſtill more abundant; for the greateſt part of what would ſeem vegetables growing there, are in fact nothing but the artificial formation of inſects, palaces which they have built for their own habitation.

If we examine the bottom of the ſea along ſome ſhores, and particularly at the mouths of ſeveral rivers, we ſhall find it has the appearance of a foreſt of trees under water, millions of plants growing in various directions, with their branches entangled in each other, and ſometimes ſtanding ſo thick as to obſtruct navigation. The ſhores of the Perſian gulph, the whole extent of the Red Sea, and the weſtern coaſts of America, are ſo choaked up in many places with theſe coraline ſubſtances, that though ſhips force a paſſage through them, boats and ſwimmers find it impoſſible to make their way. Theſe aquatic groves are formed of different ſubſtances, and aſſume various appearances. The coral plants, as they are called, ſometimes ſhoot out like trees without leaves in winter; they often ſpread out a broad ſurface like a fan, and, not uncommonly, a large bundling head, like a faggot; ſometimes they are found to reſemble a plant with leaves and flowers; and often the antlers of a ſtag, with great exactneſs and regularity. In other parts of the ſea are ſeen Sponges of various magnitude, and extraordinary appearances, aſſuming a variety of fantaſtic forms, like large muſhrooms, mitres, fonts, and flower-pots. To an attentive ſpectator, theſe various productions ſeem entirely of the vegetable kind; they ſeem to have their leaves and their flowers, and have been experimentally known to ſhoot out branches in the compaſs of a year. Philoſophers, therefore, till of late, thought themſelves pretty ſecure in aſcribing theſe productions to the vegetable kingdom; and count Marſigli, who has written very laborioufly and learnedly upon the ſubject of corals and Sponges, has not heſitated to declare his opinion, that they were plants of the aquatic kind, furniſhed with flowers and ſeed, and endued with a vegetation entirely reſembling that which is found upon land. This opinion, however, ſome time after, began to be ſhaken by Rumphius and Juſſieu, and at laſt by the ingenious Mr. Ellis, who by a more ſagacious and diligent enquiry into nature, put it paſt doubt, that corals and Sponges were entirely the work of animals; and that, like the honey-comb, which was formed by the bee, the coral was the work of an infinite number of reptiles of the polypus kind, whoſe united labours were thus capable of filling whole tracts of the ocean with thoſe embarraſſing tokens of their induſtry.

If, in our reſearches after the nature of theſe plants, we ſhould be induced to break off a branch of the coraline ſubſtance, and obſerve it carefully, we ſhall perceive its whole ſurface, which is very rugged and irregular, covered with a mucous fluid, and almoſt in every part ſtudded with little jelly-like drops, which when cloſely examined, will be found to be no other than reptiles of the Polypus kind. Theſe have their motions, their arms, and their appetites, but they ſoon expire when taken out of the ſea, and our curioſity is at once ſtopped in its career, by the animals ceaſing to give any make of their induſtry; recourſe therefore has been had to other expedients, in order to determine the nature of the inhabitant, as well as the habitation.

If a coraline plant be ſtrictly obſerved, while ſtill growing in the ſea; and the animals upon its ſurface be not diſturbed, either by the agitation of the waters, or the touch of the obſerver, the little Polypi will then be ſeen in infinite numbers, each iſſuing from its cell, and, in ſome kinds, the head covered with a little ſhell, reſembling an umbrella, the arms ſpread abroad, in order to ſeize its prey, while the hinder part ſtill remains attached to its habitation, from whence it never wholly removes. By this time it is perceived that the number of inhabitants is infinitely greater than was at firſt ſuſpected; that they are all aſſiduouſly employed in the ſame purſuits, and that they iſſue from their reſpective cells, and retire into them at pleaſure. Still, however, there are no proofs that thoſe large branches which they inhabit, are entirely the conſtruction of ſuch feeble and minute animals. But chemiſtry will be found to lend a clue to extricate us from our doubts in this particular. Like the ſhells which are formed by ſnails, muſcles and oyſters, theſe coraline ſubſtances effervеſce with acids, and may therefore well be ſuppoſed to partake of the ſame animal nature. But Mr. Ellis went ſtill farther, and examined their operations, juſt as they were beginning. Obſerving an oyſter-bed, which had been for ſome time neglected, he there perceived the firſt rudiments of a coraline plantation, and tufts of various kinds ſhooting from different parts of this favourable ſoil. It was upon theſe he tried his principal experiment. He took out the oyſters, which were thus furniſhed with coralines, and placed them in a large wooden veſſel, covering them with ſea-water. In about an hour, he perceived the animals, which before had been contracted by handling, and had ſhewn no ſigns of life, expanding themſelves in every direction, and appearing employed in their own natural manner. Perceiving them therefore in this ſtate, his next aim was to preſerve them thus expanded, ſo as to be permanent objects of curioſity. For this purpoſe he poured, by ſlow degrees, an equal quantity of boiling water into the veſſel of ſea-water in which they were immerſed. He then ſeparated each Polypus with pincers from its ſhell, and plunged each ſeparately into ſmall cryſtal vaſes, filled with ſpirit of wine mixed with water. By this means, the animal was preſerved entire, without having time to contract itſelf, and he thus perceived a variety of kinds, almoſt equal to that variety of productions which theſe little animals are ſeen to form. He has been thus able to perceive and deſcribe fifty different kinds, each of which is ſeen to poſſeſs its own peculiar mode of conſtruction, and to form a coraline that none of the reſt can imitate. It is true, indeed, that on every coraline ſubſtance there are a number of Polypi found, no way reſembling thoſe which are the erectors of the building; theſe may be called a vagabond race of reptiles, that are only intruders upon the labours of others, and that take poſſeſſion of habitations, which they have neither art nor power to build for themſelves. But in general, the ſame difference that ſubſiſts between the honey-comb and the bee, and the paper-like cells of the waſp, ſubſiſts between the different habitations of the coral-making Polypi.

With regard to the various forms of theſe ſubſtances, they have obtained different names from the nature of the animal that produced them, or the likeneſs they bear to ſome well-known object, ſuch as coralines, fungimadrepores, ſponges, aſtroites, and keratophytes. Though theſe differ extremely in their outward appearances, yet they are all formed in the ſame manner by reptiles of various kinds and nature. When examined chemically, they

they all diſcover the marks of animal formation; the corals, as was ſaid, diſſolve in acids, the ſponges burn with an odour ſtrongly reſembling that of burnt horn. We are left ſomewhat at a loſs with regard to the preciſe manner in which this multitude of cells, which at laſt aſſume the appearance of a plant or flower, are formed. If we may be led in this ſubject by analogy, it is moſt probable, that the ſubſtance of coral is produced in the ſame manner that the ſhell of the ſnail grows round it; theſe little reptiles are each poſſeſſed of a ſlimy matter, which covers its body, and this hardening, as in the ſnail, becomes an habitation exactly fitted to the body of the animal that is to reſide in it; ſeveral of theſe habitations being joined together, form at length a conſiderable maſs, and as moſt animals are productive, in proportion to their minuteneſs, ſo theſe multiplying in a ſurpriſing degree, at length form thoſe extenſive foreſts that cover the bottom of the deep.

Thus all nature ſeems replete with life; almoſt every plant on land has its ſurface covered with millions of theſe minute creatures, of whoſe exiſtence we are certain, but of whoſe uſes we are entirely ignorant; while numbers of what ſeem plants at ſea, are not only the receptacles of inſects, but alſo entirely of inſect formation. This might have led ſome late philoſophers into an opinion, that all nature was animated, that every, even the moſt inert maſs of matter, was endued with life and ſenſation, but wanted organs to make thoſe ſenſations perceptible to the obſerver: thoſe opinions, taken up at random, are difficultly maintained, and as difficultly refuted; like combatants that meet in the dark, each party may deal a thouſand blows without ever reaching the adverſary. Thoſe perhaps are wiſer who view nature as ſhe offers; who without ſearching too deeply into the receſſes in which ſhe ultimately hides, are contented to take her as ſhe preſents herſelf, and ſtoring their minds with effects rather than with cauſes, inſtead of the embarraſſment of ſyſtems, about which few agree, are contented with the hiſtory of appearances, concerning which, all mankind have but one opinion.

CHAP. III.

DIRECTIONS FOR ANGLING:

CONTAINING

The whole ART of FLOAT and FLY-FISHING,

The beſt RULES for the CHOICE of TACKLE,

And a Deſcription of NATURAL and ARTIFICIAL BAITS.

Collected from PRACTICE and OBSERVATION, as well as from the WRITINGS of the moſt Experienced Authors on the Subject.

Of ANGLING in GENERAL.

THOUGH much has been ſaid by many writers, concerning the antiquity of Angling, and in which they have introduced a great deal of fable, we ſhall content ourſelves with mentioning only two authorities, ſuch as cannot be diſputed. It is certain, that angling is much more ancient than the incarnation of our Saviour; for, in the prophet *Amos*, mention is made of fiſh-hooks; and in the Book of *Job*, which was long before the days of *Amos*, mention is alſo made of fiſh-hooks, which muſt imply anglers in thoſe times.

No diverſion is perhaps better calculated to raiſe the mind, to calm and compoſe the troubled paſſions of the ſoul, to inſpire health, content, and eaſe, than that of Angling. While the great lawyer is ſwallowed up in buſineſs, and the ſtateſman is preventing or contriving plots, the angler is perhaps ſitting on a bank enamelled with cowſlips, liſtening to the enchanting voices of the little feathered ſongſters, while the ſilver ſtream at his feet with pleaſing murmurs glides gently along. Hunting, as well as many other dangerous diverſions, may have its charms to allure ſome people to the purſuit of it; but it cannot be ſo natural as that of angling: the one is all noiſe and tumult, the other peace and ſerenity. The angler leiſurely ſurveys the wonderful works of the creation, and adores that Being, from whom he receives all his pleaſures. His retirement and ſolitude are phyſic for his ſoul, and delivers it from the hurry and various paſſions, in which other purſuits are too much involved. As exerciſe is its neceſſary companion, and a pure and clear air one of its conſtant attendants, health always follows in its train. In ſhort, the various objects which continually offer themſelves, as ſubjects for the angler's contemplation, inſpire the mind with that innocent chearfulneſs, eaſe and tranquillity, that is hardly to be expected from any other diverſion, and never to be found amidſt noiſe and tumult.

With reſpect to the qualifications of an angler, Mr. *Markham*, in his book entitled *Country Contentments*, ſays, that he ſhould be a good ſcholar, and maſter of the liberal ſciences; as a grammarian, to know how to talk or write of his art in correct language; he ſhould have ſweetneſs of ſpeech, to entice others to delight in an exerciſe ſo laudable; and ſhould have ſtrength of argument to defend and maintain his profeſſion againſt ridicule and ſlander: he muſt be bold and reſolute, neither to be afraid of ſtorms, nor affrighted at thunder. If he is not poſſeſſed of that excellent virtue, patience, and cannot endure a little faſting, he loſes all the delight which contributes to make this paſtime pleaſing.

Of the ANGLER's RODS and LINES.

THE choice of the Angler's ROD is a matter of no ſmall importance. For fiſhing at the bottom,

tom, whether with a running line or float, the reed or cane rod is, on account of its lightneſs and elaſticity, to be preferred to the hazel, eſpecially if you angle for thoſe fiſh, which bite but tenderly, as the Roach and Dace: of theſe, ſome are put up in the form of a walking ſtick. There are others, which are compoſed of many joints, and put up all together in a bag, and are therefore called bag-rods. Theſe laſt are very uſeful to travel with, as they take up but little room.

Next to theſe is the hazel rod; but that is more apt to warp than the cane. Theſe, as well as excellent fly-rods, are to be had at every fiſhing-tackle ſhop, and therefore need no particular deſcription. Be careful, however, when you beſpeak a rod of reed or cane, that the workman does not raſp down into the bark, which grows round the joints. This is a fault, of which rod-makers are too often guilty, and thereby make the rod weaker at the joints than in any other part; for, there being no bark to repel the wet, it ſoon rots, by which fault you may looſe a good fiſh, and break your rod.

It may not, however, be improper to give ſome directions for making rods, as many anglers live in thoſe parts of the country, where they are not always to be bought.

When the ſap is gone down into the roots of trees, which is generally between the latter end of November and Chriſtmas, gather the ſtraighteſt hazels you can find, in order to uſe them for ſtocks: theſe, at the larger end, muſt be about an inch, or more, in diameter. At the ſame time, gather ſhoots of a leſs ſize for middle pieces and tops. Tie them together in a bundle, and let them lie on a dry floor.

At the end of fifteen months match them together; and to the ſlender ends of the tops, after cutting off about eight or ten inches, whip a fine taper piece of whalebone of that length. Then cut the ends of the other pieces with a long ſlant, ſo that they may join exactly to each other, and ſpread ſome ſhoemaker's wax very thin over the ſlants: after this, bind them neatly with ſtrong waxed thread. Laſtly, fix a ſtrong loop of horſe-hair to the whalebone, and let the rod, ſo made, lie a week to ſettle before you uſe it. In this manner alſo you may make a fly rod; but obſerve, that the latter muſt be much more ſlender from the end of the ſtock than the former.

To make a very neat fly-rod, you muſt proceed in the following manner. Get a yellow whole deal board, which is free from knots; cut off about ſeven feet from the beſt end, and ſaw it into ſquare breadths: let a joiner plain off the angles, and make it perfectly round, a little tapering: this will ſerve for the ſtock. Then piece it to a fine ſtraight hazel, of about ſix feet long, and then a delicate piece of fine-grained yew, plained round like an arrow, and tapering, with whalebone, as before, of about two feet in length. There is no abſolutely fixing the length of a fly-rod; but one of fourteen feet is as long as can well be managed. To colour the ſtock, dip a feather in aqua fortis, and chaſe it into the deal, which will then become of a cinnamon colour.

Rods for Barbel, Carp, and other large fiſh, ſhould be of hazel, and proportionably ſtronger than thoſe for Roach and Dace. However, the following portable rod is ſo neat and uſeful, that no angler, who has once tried it, will be without it.

Let there be four joints, made of hiccary, or ſome ſuch very tough wood, and two feet four inches in length. The top muſt be bamboo ſhaved; and the ſtock of aſh, full in the graſp, of an equal length with the other joints, and with a ſtrong ferrel at the ſmaller end, made to receive the large joint, which muſt be well ſhouldered, and fitted to it with the utmoſt exactneſs. This rod will go into a bag, and lie very well concealed in a pocket, in the lining of your coat on the left ſide, made on purpoſe to receive it.

The angler's LINE, whether it be a running-line, or for float-fiſhing, had beſt be of hair, unleſs you fiſh for Barbel, and then it muſt be of ſtrong ſilk; but remember, that the ſingle hair is to be preferred for Roach or Dace fiſhing. The fly line muſt be very ſtrong; and, for the greater facility in throwing, ſhould be eighteen or twenty hairs at the top, diminiſhing gradually to the hook. Lines are ſold at the fiſhing ſhops, which have no joints, but are wove in one piece. But, notwithſtanding this and other improvements, as ſome may perhaps ſtill chuſe to make their own lines, we ſhall endeavour to give ſome directions for that work.

Your hair muſt be round and clear, and free from galls or frets; for a well choſen, even, clear, round hair, of a kind of glaſs colour, will prove as ſtrong as three that want thoſe perfections. You will ſeldom find a black hair which is not round; but many white ones are flat and uneven; for which reaſon, if you get a lock of round, clear, glaſs coloured hair, you ought to make much of it.

In making your lines obſerve this rule: firſt let your hair be well waſhed before you ſet about twiſting it; and then chuſe not only the cleareſt hair for it, but ſuch as are of an equal ſize; for then they generally ſtretch and break all together, which hairs of an unequal ſize never do, but break ſingly, and thereby deceive the angler in the ſtrength of his line. When you have twiſted your links, lay them in water for a quarter of an hour at leaſt, and then twiſt them over again before you tie them into a line.

Though many prefer twiſting hairs with the fingers, yet we would rather recommend a little engine for that purpoſe, which is ſold at all the fiſhing tackle ſhops in London, with proper directions for uſing it.

When you uſe the fly, you will find it neceſſary to continue your line to a greater degree of fineneſs: in order to which, ſuppoſing your line to be ten yards in length, let your upper link conſiſt of nine or twelve hairs, diminiſhing the number in the ſucceeding links, till you come to the ſize of a fine graſs, and to the end of this fix your hook-link, which ſhould be either of very fine graſs, or ſilk-worm gut. A week's practice will enable a learner to throw out one of theſe lines; and he may lengthen it, by a yard at a time, at the greater end, till he can throw fifteen yards neatly; till when, he is to reckon himſelf but a novice.

As to the colour of your line, you muſt be determined by that of the river in which you fiſh; but we have generally found, that a line of the colour of pepper and ſalt (which is made by mixing a black hair among the white ones in twiſting) will ſuit any water.

Indian or ſea graſs makes excellent hook-links; and, though ſome object to it, as being apt to grow brittle and ſnap in uſing, yet with proper management, it is the beſt material for the purpoſe yet known, eſpecially if ordered in the following manner.

Take as many as you pleaſe of the fineſt you can get, put them into any veſſel, and pour therein the ſcummed fat of a pot, wherein freſh (but by no means ſalt) meat has been boiled. When they have lain three or four hours, take them out one by one, and ſtripping the greaſe off with your finger and thumb, ſtretch each graſs as long as it will yield, coil them up in rings, and lay them by. You will then find them become nearly as ſmall, full as round, and much ſtronger, than the beſt ſingle hairs you can get. To preſerve them moiſt, keep them in a piece

of bladder well oiled, and, before you uſe them, let them ſoak about half an hour in water, or in your walk to the river ſide, put a length of it into your mouth. If your graſs is coarſe, it will fall heavily on the water, and ſcare away the fiſh; on which account gut has the advantage. After all, if your graſs is fine and round, it is the beſt thing you can uſe.

Silk muſt never be mixed with hair lines; and, though ſilk lines are very apt to rot and break, yet they may ſerve in ſome places, where good hair is not eaſily to be come at. In this caſe a good angler will always make the loweſt part of ſuch lines of the ſmalleſt lute or viol ſtrings.

The next thing to be conſidered is the FLOAT, which, for river fiſhing, ſhould be of cork; but, for ponds and ſtanding waters, quills will do very well, as alſo in ſlow rivers, when you angle near the top with tender baits or paſtes. Let your cork be the fineſt, and free from flaws; bore it through with a ſmall hot iron, and thruſt it on to a ſizeable quill, after having ſhaped the former with a penknife to the likeneſs of a pyramid, egg, or pear, of a proportionable bigneſs, and finely ſmoothed on a pumice ſtone. Run your line through the quill, and wedge it in with the uppermoſt hard part of the quill, the ſmaller end of the cork being towards the hook, and the bigger towards the rod. Let the cork be ſo poiſed with lead on the line, that the quill ſtanding directly upright, the leaſt bite or nibble may ſink the cork.

A cork float, for one hair, muſt be no bigger than a pea; for three, as big as a bean; for ſix, as a ſmall walnut; and for twelve hairs, as big as a French walnut.

Quill floats may be bought every where; and, if it chance to be bruiſed or ſplit, ſave the plug, and it will ſerve another. If the water gets in at the top, cover it with ſealing-wax; or if your plug be looſe, take bees-wax bruiſed ſmall, chalk ſcraped fine, and powdered black roſin, of each an equal quantity. Melt them in a ſpoon, and mix them well as they melt, which will be a proper cement to faſten it, by dipping the plug in, and immediately putting it into the float; for it cools as ſoon as ſealing wax.

In chuſing HOOKS, mind that they are ſharp at the point, the beards not broken, of proper length, and the wire well tempered and firm: a ſhort-ſhanked hook is eſteemed beſt.

Thoſe hooks, which are now known by the name of Kerby's hooks, for ſhape and temper, exceed all others. The ſize of your hook muſt be regulated by the fiſh for which you intend to angle. Barbel and Chub require large hooks; Carp, Eels, Tench, Pearch, and Bream, a moderate ſized hook; Smelts, Roach, Dace, and Gudgeons, require a ſmall one. To ſharpen a dull hook, you ſhould carry a whet-ſtone about two inches long, and a quarter ſquare, that being much better than a file, which rather leaves it rough than ſharp.

Of the other Sorts of TACKLE neceſſary in ANGLING.

THE angler who purſues his ſport at any diſtance from home, muſt be ſupplied with many articles, ſuch as a rod with a ſpare top; lines coiled up, and neatly laid in round flat boxes; ſpare links, ſingle hairs, and waxed thread and ſilk; plummets of various ſizes, floats of all kinds, and ſpare caps; worm bags, and a gentle-box; hooks of all ſizes, and ſome whipped to ſingle hairs; ſhot, ſhoemaker's wax, in a very ſmall gallipot covered with a bit of leather; a clearing ring, a landing net, a ſharp knife, and a pair of ſciſſors. All theſe things, however, may be contained in a wicker panier of about twelve inches wide, and eight high. But let us proceed to examine ſome of the angler's materials more particularly.

The PLUMMET, which is uſed in order to try the depth of the water, in which you intend to angle, ſhould be made of ſheet lead, that, by opening it, you may at any time the more eaſily fix it on the hook without any fear of loſing it.

The LANDING NET muſt be deep, with a round iron rim at top, made to faſten to the end of a long ſtick, in order to land ſuch fiſh, as are too heavy for your tackling. At the other end of the ſtick ſhould be a large hook, which you may thruſt into the mouths of Salmon, and ſuch other fiſh as are too bulky for your net, and by that means bring them ſafe to ſhore.

The CLEARING RING is uſed to diſengage your hook, when it has caught hold of a weed, &c. It muſt be thick and heavy, but not wider than the round part of your hook, and is thus to be uſed. Take off the thick joints of your rod, and ſlip the ring over the remaining ſmall ones, and holding a cord faſtened to the ring, let it fall gently. This, as ſoon as it reaches the hook, will diſengage it, by the aſſiſtance of your gently pulling the cord.

The GORGER is a ſmall piece of cane, of five inches long, and a quarter of an inch wide, with a notch at each end. With this, when a fiſh has gorged your hook, you may, by putting it down his throat till you feel the hook, and holding the line tight while you preſs it down, eaſily diſengage it.

It would be needleſs to give any deſcription of the uſe of knives, ſciſſors, wax, thread, &c. as theſe materials of themſelves explain the various purpoſes they are intended to ſerve.

Of FLOAT FISHING, and of LIVE and DEAD BAITS.

WITH reſpect to FLOAT FISHING, there are ſome rules, with which the young angler ought to be acquainted. Let the rod be light and ſtiff, and yet ſo ſmart in the ſpring, as to ſtrike at the tip of the whalebone: from fourteen to fifteen feet is a good length for the rod.

In places where you ſometimes meet with Barbel, the line ſhould be ſix or ſeven hairs at top: then diminiſhing gradually for two yards, let the reſt be ſtrong Indian graſs, to within about half a yard of the hook, which may be whipped to a fine graſs, or ſilk-worm gut. This line will kill a fiſh of ſix pounds weight.

For mere Roach and Dace fiſhing accuſtom yourſelf to a ſingle hair, with which an artiſt may kill a fiſh of a pound and a half weight.

For your float, in ſlow ſtreams, a neat round gooſe quill is proper; but for deep or rapid rivers, or in an eddy, the cork, ſhaped like a pear, is indiſputably the beſt, which ſhould not, in general, exceed the ſize of a nutmeg. Let not the quill, which you put through it, be more than half an inch above and below the cork; and this float, though ſome prefer a ſwan's quill, has great advantage over a bare quill; for the quill, being defended from the water by the cork, does not ſoften; and the cork enables you to lead your line ſo heavily, that the hook ſinks almoſt as ſoon as you put it into the water; whereas, when you lead but lightly, it does not get to the bottom till it is near the end of your ſwim. In leading your lines, be careful to balance them ſo nicely, that a very ſmall touch will ſink them. Some uſe, for this purpoſe, lead ſhaped like a barley-corn; but there is nothing better to lead with than ſhot; which you muſt have ready cleft always with you, remembering, that when you fiſh fine, it is better to have on

your line a great number of ſmall than a few large ſhot.

Whip the end of the quill round the plug with fine ſilk, well waxed, which will keep the water out of your float, and preſerve it greatly.

In fiſhing with a float, your line ſhould be about a foot ſhorter than your rod; for, if it is longer, you cannot ſo well command your hook when you come to diſengage the fiſh.

Pearch and Chub are caught with a float, and alſo Gudgeons, and ſometimes Barbel and Grayling. For Carp and Tench, which are ſeldom caught but in ponds, uſe a very ſmall gooſe or duck quill float; and for ground bait, you may every now and then throw in a bit of chewed bread. For Barbel, you may bait the place, the night before you fiſh, with graves, which are the ſediments of melted tallow, and may be had at the tallow-chandlers: uſe the ſame ground bait, while you are fiſhing, as for Roach and Dace. In fiſhing with a float for Chub, in warm weather, fiſh at mid-water; in cool weather, lower; and, when it is very cold, at the bottom.

Having thus given ſome neceſſary rules for float fiſhing, we ſhall proceed to a particular deſcription of baits in general for that purpoſe.

The ASH GRUB is a ſoft, white inſect, found, bent head to tail, under the bark of any decayed aſh, oak, or alder, that has been ſome time felled. It is to be preſerved in bran.

Of BEES, the black ones that breed in clay walls, at the top of the water, and the humble bees, which breed in long graſs, at the bottom, are good baits for the Chub.

BOBS are of two colours, yellow and red. The former are gathered in the furrows of freſh-ploughed lands; the latter under cow dung. They are ſummer baits only, and muſt be ſcoured in bran, dry moſs, or meal.

BRANDLINGS are worms uſually found in old dung-hills, or places near them, as alſo in tanners bark, when thrown up in heaps after uſe. They muſt not be put in water above an hour before uſe, and then into fennel for immediate uſe. If you intend them for long keeping, put them into an earthen pot with plenty of moſs, freſh ſhifted every three or four days in ſummer, and every week in winter; or, at leaſt, the moſs muſt be clean waſhed and ſqueezed. The point of the hook muſt be put in at the end of his tail, and run up to the belly, and very near the head, which muſt be left hanging down. Some call this worm by the name of the Gilt-tail.

CADEWS, CADIS, or CASE WORMS, are of various ſorts, and in their maggot ſtate thus houſe themſelves: one ſort in ſtraws, called from thence Straw-Worms; others in two or more ſticks, laid parallel to one another, creeping at the bottom of brooks; others, with a ſmall bundle of pieces of ruſhes, duck-weed, ſticks, &c. glued together, with which they float on the top, and can row themſelves therein about the water, with the help of their feet: both theſe are called Cad-Baits.

All theſe animals have a wonderful faculty in gathering ſuch bodies as are fitteſt for their purpoſe, and then glueing them together, ſome being heavier than water, that the animal may remain at the bottom, where its food is, (for which purpoſe they uſe ſtones, with ſticks, ruſhes, &c.) and ſome being lighter than water, to float on the top, and gather its food from thence. Theſe little houſes look coarſe, and outwardly ſhew no great artifice; but are well ſecured, and made within of a hard tough paſte, into which the hinder part of the maggot is ſo fixed, that it can draw its ſhell after it any where, without danger of leaving it behind, as alſo to thruſt out its body to reach what it wants, or to draw it into its cell, to guard it againſt injuries.

The PIPER is a Cadis, whoſe huſk or caſe is a piece of reed, about an inch long, and nearly as big round as a ſilver two-pence. Theſe worms, being kept three or four days in a woollen bag, with ſand at the bottom of it, and the bag wet once a day, will in three or four days turn yellow, when they are an excellent bait for the Chub, or indeed for any great fiſh, being a large bait.

There is alſo a ſmaller Cadis worm, called a COCK-SPUR, being in ſhape like the ſpur of a Cock, ſharp at one end, and the caſe or houſe, in which it dwells, is made of ſmall huſks, gravel, and ſlime, in a moſt curious manner, ſo as not to be imitated by the art of man.

There is another Cadis, called by ſome a ROUGH-COAT, whoſe houſe or caſe is made of little pieces of ruſhes, ſtraws, and water-weeds, which are ſo knit together with condenſed ſlime, that they ſtick about the huſk or caſe not unlike the briſtles of a hedge-hog.

Theſe three Cadis are commonly taken in the beginning of ſummer, and are good for any kind of float fiſhing. Theſe at particular times of the year turn into flies; but to purſue this ſubject further, would be leading the young angler into a very difficult purſuit, highly improper upon this occaſion.

DOCK-WORMS are found by plucking up the plants of that name, and waſhing their roots from the earth. In their fibres are little caſes of a red or yellow colour, which upon being opened with a pin, will diſcover the worm; they are kept in bran, like the gentle.

EARTH BOBS, or GRUBS, are the brood of a beetle found in the furrows of freſh ploughed land. Gather a number of them, and put them, with a peck or two of their own earth, into a tub, and cover them from froſt or cold. Thus you may keep them all winter, and kill fiſh with them at all times. Put them into earth and honey a day before uſed, and they will be an excellent bait for Bream or Carp.

GENTLES, or MAGGOTS, are eaſy to be got or bed by putrefaction, and ſcoured well with wheat bran. They are ſometimes added to a worm on the hook, often to a dub-fly; but oftener by themſelves, two or three on a hook. You may breed and keep them thus. Take a piece of the liver of any beaſt, and, with a croſs ſtick, hang it in ſome corner, over a pot or barrel half full of dry clay; and as they grow big, they will fall into the barrel, where they will ſcour themſelves, and be ready for uſe whenever you want them. In this manner they may be produced till after Michaelmas. If you deſire to fiſh with them all the year, get a dead cat or kite, let it be fly blown, and when the gentles begin to ſtir, bury it and them in moiſt earth, but as free from froſt as you can, and you may dig them up whenever you want to uſe them. They will laſt till March, when they will turn to flies.

LOB WORMS are found in gardens or in meadow grounds, after rain, by the help of a lanthorn at night. The beſt are thoſe, which have a red head, a ſtreak down the back, and a broad tail. They may be ſcoured in fennel or moſs waſhed clean, wetted, ſqueezed dry, and often changed: but the beſt way is to take a piece of very coarſe cloth, waſhed clean and dried, and then ſoaked in freſh beef liquor, in which there has been no ſalt; wring it, but not too dry; lay it in a broad, deep, glazed earthen pan, and your worms in it, to creep through and ſcour themſelves in. Rinſe it out in the ſame ſort of liquor every two days, and your worms will keep a month, if ſet in a cool place, and be in excellent order. Put what you want for preſent uſe in wetted moſs ſqueezed.

RED WORMS are found in rotten earth, or dung-hills, chiefly of cow or hog's dung; but the beſt are found among tanners bark.

WATER FROGS, which, about February or

March, breed in ditches, are not venomous, and are a good bait for ſome fiſh, Pike in particular. Put the hook through his mouth, and out of one of his gills. Then ſew the upper part of his leg, with only one ſtitch, to the arming wire of your hook, and he will live a long time.

Of SNAILS, the little white one is a bait for the Roach, and the black one ſlit for a Chub.

WASPS, when dried in an oven, or boiled, are good baits.

PASTES are of various ſorts; and, though ſome of them have been mentioned before, it may not be improper to bring them into one general view.

Old cheeſe and turpentine, and a bit of fat ruſty bacon, compoſe an excellent bait for the Chub in winter.

Take ſome of the fineſt flour, drop a little milk or water upon it, and work it well in the palm of your hand, till almoſt dry. Then temper it with a ſmall quantity of the fineſt honey, make it into a round ball, and keep it in a moiſt linen cloth, or it will grow dry and hard. If you would have it yellow, mix turmerick with it; if of a fleſh colour, vermillion, and knead it well.

Take ſome old Cheſhire cheeſe, the crumb of a French roll, and ſome ſheep's kidney-ſuet, beat them in a mortar into a paſte, adding as much clarified honey as will ſoften it. This is excellent for a Chub.

Take Shrimps and Prawns, pull off the ſhells, and ſkins, and beat the clear meat in a mortar, with a little honey, till it comes to a paſte: with this cover the point of the hook.

Grate fine bread in a little clear water, in which gum ivy has been ſoaked, and you will find it a good bait for Roach and Dace.

For Carp or Tench, you may mix crumbs of bread with honey, and you will often find it anſwer your wiſh.

With reſpect to the uſe of paſtes, obſerve theſe general rules. Proportion the quantity of paſte you put upon your hook to the ſize of the fiſh, for which you angle. Paſtes muſt not be angled with in rapid ſtreams; but on ſmall hooks, in pits, ponds, lakes, or ſlow running rivers.

WHEAT. A handful or two of the beſt wheat, boiled in a little milk till ſoft, and fried leiſurely with honey, and a little beaten ſaffron diſſolved in milk, is a good bait for Roach, Dace, Chub, or Grayling.

Of FLY FISHING.

FLY FISHING, or fiſhing at the top of the water, is of two ſorts; with a natural and living fly, or with an artificial and made fly.

Of the natural flies, thoſe moſtly in uſe are the Green-Drake and the Stone-Fly, and theſe in the two months of May and June only; but there are others, of which, as well as of theſe, we ſhall give a ſhort hiſtory at the end of this account of Fly-Fiſhing.

Theſe are to be uſed with a ſhort line, not more than half the length of your rod, if the wind is ſtill; but, if you have a wind that will carry it from you, it may then be longer. This way of fiſhing is called Dapping, Dabbling, or Dibbling, wherein you are always to have your line flying before you up or down the river, as the wind ſerves, and to angle as near as you can to the bank of the ſame ſide on which you ſtand; though, when you ſee a fiſh riſe near you, you may guide your fly over him, whether in the middle, or on the contrary ſide, and if you are pretty well out of ſight, either by kneeling, or the interpoſition of a bank or buſh, you will be always ſure to take him, provided you are quick in your motions: your fiſh may otherwiſe remove to ſome other place, if it be in the ſtill deeps, where he is always in motion, and roving up and down for prey; but in a ſtream you may generally, eſpecially if there is a large ſtone near, find him in the ſame place. Your line, in this caſe, ought to be of three good hairs next your hook; becauſe in this kind of angling you are to expect the largeſt fiſh, and that, wanting length to give him line after he is ſtruck, you muſt be forced to tug for it. However, not an inch of your line being ſuffered to touch the water in dibbling, it may be allowed to be ſtronger on that account.

We come now to the ſecond way of angling at the top of the water, which is with an artificial fly. In this kind of ſport, you are to angle with a line longer by a yard and a half, and ſometimes two yards, than your rod; and with both this and the other, in a calm day in the ſtreams, in a breeze that curls the water in the ſtill deeps, you are likely to ſtrike the beſt fiſh.

For the length of your rod, you are always to be determined by the breadth of the river in which you intend to angle. For a Trout river, one of five or ſix yards is long enough. If it is longer, be it ever ſo neatly and artificially made, it will ſoon become tireſome, and change your ſport into toil and labour.

The length of the line, to a man that knows how to handle his rod, and caſt it properly, is no manner of incumbrance, excepting in woody places, and in landing of a fiſh, which every one, who can afford to angle for pleaſure, has ſomebody to do for him; and the length of line is a great advantage in fiſhing at a diſtance: to fiſh fine, and far off, is a principal matter in Trout angling.

Your line in this caſe ſhould never be leſs, nor ever exceed two hairs next the hook; for one, whatever ſome may pretend, is not ſufficient, as the leaſt accident, even with the fineſt hand, may break it. However, he that cannot kill a Trout of twenty inches long with two hairs, in a river clear of wood and weeds, deſerves not the name of an angler.

To have your whole line as it ought to be, two of the firſt lengths, neareſt the hook, ſhould be of two hairs each, the next three lengths above them of three, the next three above them of four, and ſo of five, ſix and ſeven, to the very top; by which means your rod and tackle will, in a manner, be taper from your very hand to your hook, your line will fall much better and ſtraighter, and caſt the fly to any certain place, to which the hand and eye ſhall direct it, with leſs weight and violence, which would otherwiſe circle the water, and fright away the fiſh.

In caſting your line, do it always before you, and in ſuch a manner, that your fly may firſt fall upon the water, and as little of your line with it as poſſible; though, if the wind be very briſk, you will then of neceſſity be obliged to ſink part of your line to keep your fly in the water. In caſting your fly you muſt aim at the further, or nearer bank, as the wind ſerves your purpoſe, which will be with and againſt you ſeveral times, on the ſame ſide, in an hour, as the river winds in its courſe, and you will be forced to angle up and down by turns accordingly; but you muſt endeavour, as much as you can, to have the wind on your back, and always be ſure to ſtand as far off the bank as your length of line will give you leave, when you throw to the contrary ſide. When the wind will not permit you ſo to do, and that you are forced to angle on the ſame ſide on which you ſtand, you muſt then go to the very brink of the river, and caſt your fly, at the utmoſt length of your rod and line, up or down the river as the gale ſerves.

Having now done with both ways of fiſhing at the top of the water, and the length of your rod and line for thoſe purpoſes, we ſhall proceed to mention what materials the angler ſhould be ſupplied with, in order

order to make artificial flies. As to the making them, many writers on angling have attempted to give directions for that purpoſe; but it is certain, if the angler is ſupplied with proper materials, and has the opportunity of ſeeing expert artiſts make flies, he will learn more from one week's practice and obſervation, than he poſſibly can in a twelvemonth from the peruſal of any book that was ever wrote on that ſubject.

Firſt, you muſt be provided with bear's hair of different colours, as grey, dun, light, and dark-coloured, bright brown, and that which ſhines. Alſo camel's hair, dark, light, and of a colour between both. Badger's hair, or fur. Spaniel's hair from behind the ear, light and dark brown, blackiſh and black. Hog's down, which may be had about Chriſtmas of butchers, or rather of thoſe that make brawn: it ſhould be plucked from under the throat, and other ſoft places of the hog. Theſe ſhould be either black, red, whitiſh, or ſandy. If you want them of any other colour, you may ſend them to the dyer's.

Seal's fur is to be had at the trunk-maker's. This you may get dyed of the colour of calves and cows hair, in all the different ſhades, from the lighteſt to the darkeſt brown. You will then never need cows or calves hair, both which are harſh, and will never work kindly, nor lay handſomely.

Get alſo mohairs, black, blue, purple, white, and violet; camlets, both hair and worſted, blue, yellow, dun, light and dark brown, red, violet, purple, black, pink, and orange colours.

A piece of an old Turkey carpet will furniſh excellent dubbing: untwiſt the yarn, and pick out the wool, carefully ſeparating the different colours, and lay it by.

Get alſo furs of the following animals, viz. the ſquirrel, particularly from his tail, fox cub, from the tail where it is downy, and of an aſh colour: an old fox, an old otter, a hare, from the neck, where it is of the colour of withered fern; and above all, the yellow fur of the martern, from off the gills or ſpots under the jaws. All theſe, and almoſt every other kind of fur, are eaſily got at the furriers.

Hackles are a very important article in fly making. Theſe are the long ſlender feathers, which hang from the head of a cock down his neck. Fine ones may be alſo taken from near his tail; but be careful that they are not too rank, which they always are when the fibres are more than half an inch long. Be provided with theſe of the following colours, red, dun, yellowiſh, white, orange and perfect black; and whenever you meet, alive or dead, with a cock of the game breed, whoſe hackle is of a ſtrong brown red, never fail to buy him. Obſerve, however, that the feathers of a cock chicken, be they ever ſo fine for ſhape and colour, are good for little; for they are too downy and weak to ſtand erect after they are once wet; and ſo are thoſe of the bantam cock.

Feathers are abſolutely neceſſary for the wings, and other parts of flies: get therefore feathers from the back and other parts of the wild mallard, or drake; the feathers of a partridge, eſpecially thoſe red ones that are in the tail; feathers from a cock pheaſant's breaſt and tail; the wings of a blackbird, a ſtarling, a jay, a fieldfare, and a water coot; feathers from the crown of the pewit, plover, or lapwing, and feathers from a heron's neck and wings.

Be provided with marking ſilk of all colours, fine, but very ſtrong; gold and ſilver flatted wire or twiſt, a ſharp knife, hooks of all ſizes, hog's briſtles for loops to your flies, ſhoemaker's wax, &c.

Remember, with all your dubbing, to mix bear's hairs, and hog's wool, which are ſtiff, and not apt to imbibe the water, as the fine furs, and moſt other kinds of dubbings do; and remember alſo, that martern's fur is the beſt yellow you can uſe.

The angler, who poſſeſſes theſe materials, and obſerves the manner in which ſkilful fly makers uſe them, will ſoon be enabled to form any fly whatever; for this art, like every other, is to be acquired only by practice. We might form an entire volume of nothing but liſts of artificial flies for the uſe of every month in the year, which, inſtead of improving the young angler, would only contribute to diſhearten and perplex him; we ſhall therefore content ourſelves with mentioning only the twelve following:

1. The DUN FLY, in March: the body is made of dun wool, and the wings of the partridge's feathers.

2. Another DUN FLY, the body of which is made of black wool, and the wings of the black drake's feathers, particularly thoſe under his tail.

3. The STONE FLY, in April, whoſe body is made of black wool, coloured with yellow under the wings and tail. For this fly you muſt uſe the wings of the drake.

4. The RUDDY FLY, in the beginning of May. Make his body of red wool, wrapt about with black ſilk. The feathers to be uſed are the wings of the drake, and the feathers of a red capon, which hang down on his ſides next to the tail.

5. The YELLOW or GREENISH FLY, in May. Make the body of yellow wool, and the wings of the red cock's hackle or tail.

6. The BLACK FLY, in May, whoſe body may be made of black wool: the wings are made of thoſe of a brown capon.

7. The YELLOW FLY, in June. His body is made of black wool, with a yellow liſt on each ſide. The wings ſhould be formed of feathers taken from the wings of a buzzard, bound with black hemp.

8. The MOORISH FLY, whoſe body is made with darkiſh wool, and the wings of the ſame coloured mail of the drake.

9. The TAWNY FLY, which is good till the middle of June. The body is made of tawny wool, and the wings of the whitiſh mail of the wild drake.

10. The WASP FLY, in July. Make his body of black wool wrapped about with yellow ſilk: the wings muſt be made of the feathers of the drake or buzzard.

11. The SHELL FLY, which is uſeful in the middle of July. The body is made of greeniſh wool, wrapped about with the hurle of a peacock's tail, and the wings with feathers from thoſe of a buzzard.

12. The DARK DRAKE FLY, which is good in Auguſt. The body is made with black wool, wrapped about with black ſilk. His wings are made with the mail of the black drake, with a black head.

Having ſaid thus much of artificial fly-making, it may not be improper to give the young angler a ſhort account of a few of the moſt material natural flies, in imitating which he may employ himſelf at home, when the weather will not permit him to purſue his ſport abroad; and he may be aſſured, that, in collecting and arranging the materials, and imitating the various ſhapes and colours of theſe admirable creatures, he will ſoon find little leſs pleaſure than even in catching fiſh.

The GREEN DRAKE FLY comes in about the middle of May; but are never properly fit for uſe till the end of that month, or the beginning of June, though they are ſooner or later, according to the ſeaſon of the year.

The STONE FLY comes much ſooner, ſo early as the middle of April, but is not properly in ſeaſon till the middle of May. He continues to kill much longer

longer than the green drake remains with us, even ſo long as almoſt to the end of June.

Both theſe flies, and perhaps many others, are certainly bred in the very rivers where they are taken. Our cadis, which lie under ſtones in the bottom of the water, turn into theſe two flies; and, being taken in their huſk near the time of their maturity, are very eaſily known and diſtinguiſhed, being the largeſt of all others.

The green drake never diſcloſes from his huſk till he is there firſt grown to full maturity, body, wings, and all; and then he creeps out of his cell, but with his wings ſo cramped and ruffled, by being preſſed together in ſo narrow a compaſs, that they are for ſome hours totally uſeleſs to him. Hence he is compelled either to creep upon the flags, ſedges, and blades of graſs, if his firſt riſing from the bottom of the water be near the banks of the river, till the air and ſun ſtiffen and ſmooth them. If his firſt appearance above water happens to be in the middle of it, he then lies upon the ſurface of the water; for his feet are totally uſeleſs to him there, as he cannot, like the ſtone-fly, creep upon the water, until his wings have acquired the neceſſary ſtiffneſs. In the mean time, it is a chance, if he does not fall a prey to ſome trout or grayling. If he eſcapes theſe fiſh, his wings ſoon get ſtrength, which ſtand on his back like thoſe of a butterfly, and his motion in flying is the ſame.

The body of this fly is, in ſome, of a paler, in others, of a darker yellow; for they are not in all exactly of a colour. They are ribbed with rows of green, long, ſlender, and growing ſharp towards the tail, at the end of which they have three ſmall whiſks of a very dark colour, almoſt black, and their tails turn up towards their back like a mallard, from whence undoubtedly they have the name of Green Drake.

With theſe the angler muſt dibble; and, having gathered a ſufficient quantity of them into a draw-box, with holes in the cover to give them air, where they will continue vigorous and freſh a night or two, he may take them out thence by the wings, and bait them upon the hook in the following manner:

Firſt take out one, (for you muſt fiſh with two of them at a time) and, putting the point of the hook into the thickeſt part of his body under one of his wings, run it directly through, and out at the other ſide, leaving him ſpitted croſs upon the hook. Then, taking the other, put him on after the ſame manner; but with his head the contrary way. In this poſture they will live upon the hook, and play with their wings for more than a quarter of an hour. You muſt take care to keep their wings dry in playing them on the water, and that your fingers are not wet when you take them out to bait them; for then your bait will be ſpoiled.

With reſpect to this fly, it remains only to acquaint the angler, that it is taken at any time of the day.

We muſt now be a little more particular concerning the ſtone-fly, which has not the patience to continue in his cruſt or huſk till his wings are full grown; but as ſoon as they begin to put themſelves out, he feels himſelf ſtrong, ſqueezes himſelf out of his priſon, and crawls to the top of ſome ſtone, where, if he can find a chink that will receive him, or can creep between two ſtones, the one lying hollow upon the other, he there lurks till his wings are full grown: that is your only place to find him, and from thence he undoubtedly derives his name. For want of ſuch a convenience, he will make ſhift with the hollow of a bank, or any other place, where the wind cannot come at him to force him away.

His body is long, and pretty thick, and almoſt as broad at the tail as in the middle. His colours are a very fine brown, ribbed with yellow, and much yellower on the belly than the back. He has alſo two or three whiſks at the tag of his tail, and two little horns upon his head. His wings, when full grown, are double, and flat down his back, of the ſame colour, though rather darker than his body, and alſo longer. He makes but little uſe of his wings; for he is ſeldom ſeen flying, though often ſwimming and paddling in the water with the ſeveral feet he has under his belly, without ſtirring a wing: whereas the drake will mount ſteeple high into the air, though he is to be found every where high and low near the river.

The ſtone-fly is to be uſed much in the ſame manner as before directed for the drake; but the trout is found to take the latter more greedily than the former.

The LITTLE YELLOW MAY FLY is in ſhape exactly as the green drake; but is very little, and of as bright a yellow as can be ſeen.

The CAMLET FLY is in ſhape like a moth, with fine watered wings, and is an excellent bait for the grayling. This fly, though it comes in May, continues all the month of June.

The PALMER FLY is a caterpillar, or worm, which never continues long in one ſtate, though their colours are very elegant and beautiful. The following is a deſcription of one of them in their moſt brilliant dreſs. His lips and mouth are a little yellow, his eyes black as jet, his forehead purple, his feet and hinder parts green, his tail two-forked and black, the whole body ſtained with a kind of red ſpots, which run along the neck and ſhoulder blade, not unlike the form of a St. Andrew's croſs, and a white line drawn down his back to his tail. At a fixed age, this caterpillar ceaſes to eat, and towards winter is covered over with a ſtrange ſhell or cruſt, called an Aurelia, and in that manner remains in a ſtate of total inaction during the whole winter; but in the ſpring following, he commences a painted butterfly. To purſue this curious inſect through all its various changes, would be uſeleſs here, as it is ſufficiently deſcribed in other parts of this work.

The OAK FLY is alſo known by the name of the ASH FLY and the WOODCOCK FLY. Bowkler, in his Art of Angling, ſays, "This fly, as I have lately been informed by a gentleman of veracity, is bred in thoſe little balls, which grow on the boughs of large oaks, commonly called oak apples, which he accidentally diſcovered by opening ſeveral of theſe balls, which had been gathered in the winter, and brought into the houſe. In each of them he found a fly, ſome of which, being enlivened by the warmth of the room, immediately took flight, and fixed in the window, with the head downwards, the poſition they obſerve on the trees."

This fly is found on the body of an oak or aſh, from the beginning of May to the end of Auguſt. It is of a brown colour, and is eaſily-taken.

The ANT FLY is often found in June, though it is in its higheſt perfection in July, and laſts till Auguſt and September. They muſt be taken from their hills, with a handful of their earth, and roots of the graſs about them, and put all together in a large glaſs bottle. If they are not bruiſed in taking, nor their wings hurt, they will live above a month. If you would keep them longer, put them into a barrel, firſt waſhing it with honey and water. They are very good baits for roach, dace, or chub, fiſhing near the ground.

Of ROCK ANGLING, NIGHT ANGLING, &c.

ROCK-FISHING is practiſed chiefly in the South and South-Weſt parts of England, and in ſome parts of Ireland. When you fiſh from rocks, your

your line muſt be very ſtrong, and conſiſt at leaſt of five or ſix hairs in a link. A float is neceſſary, and two hooks, one to reach the bottom, and the other to keep in mid-water. The beſt time for this ſport is, when the tide is half ſpent; and till within two hours of high water. Morning and evening are the moſt preferable times, if the tide anſwers. The cockle, lob, and marſh-worms are the general baits uſed, and a hairy worm found on the ſea ſhore. The prizes of this fiſhing are only Sea Bream, Flounders, Whiting-Pollock, and Rock-Whitings.

With reſpect to NIGHT ANGLING, few other fiſh are taken at that time but Trout and Eels. In the night, the beſt Trout come out of their holes, when they are taken on the top of the water with a great lob or garden worm, or rather two, which you are to fiſh with in a place, where the water runs quietly; for in a ſtream the bait will not be ſo well diſcerned.

In a dead place, near a current, draw your bait over the top of the water, backwards and forwards, and, if there is a Trout in the hole, he will take it, eſpecially if the night is dark; for then he is bold, and lies near the top of the water, watching the motion of every frog, or any thing elſe, that ſwims between him and the ſky. He hunts after his prey, if he ſees the water but wrinkle, or move in one of theſe dead holes, where the large old Trouts uſually lie, near to their holds; for he is both ſubtle and fearful, and does not uſually ſtir out of his hole, but lies in it as cloſe in the day, as the timorous hare does in her form. The chief feeding of either is ſeldom in the day, but uſually in the night, and then the large Trout feed very boldly.

You muſt fiſh for him with a ſtrong line and a large hook, and let him have time to bite; for he does not uſually forſake the hook at night, though he does frequently in the day. If the night is not dark, you muſt in that caſe fiſh with an artificial fly of a light colour, and at the ſnap; indeed, in the night, he will riſe at almoſt any thing.

Night angling is not, however, to be recommended, as it is in ſome meaſure dangerous, and very unwholeſome.

The ſafeſt method of catching fiſh by night, particularly Eels, is by lines left in the water from the evening till the next morning. For this purpoſe, your line muſt be fifteen or twenty yards long, according to the width of the place in which you intend to throw it. To this, at equal diſtances, tie five or ſix hempen lines, of a moderate thickneſs. To each of theſe whip a hook, and bait with a Minnow, or any ſmall fiſh; but, if they are not to be had, you may make uſe of a large lob-worm, or even a piece of beef. If you bait with a fiſh, put the point of the hook in at the tail, and out at the mouth, and cover the point of the hook with a ſmall worm. At the hook end of the cord, faſten a weight about two pounds, and throw it acroſs the river into ſome ſtill deep, or at the tail or ſide of a deep current, firſt taking care, however, to faſten the other end of the line round a tree, or to ſome other ſecure place. When you go in the morning, it will be a chance if you do not find fiſh enſnared on the hooks.

There are other methods of catching fiſh, ſuch as bobbing, dabbing, ſniggling, ſnapping, trolling, and fiſhing at hand. Of the three firſt, we have already made mention; we ſhall now proceed to deſcribe the three laſt.

SNAPPING is a method of catching Pike with a rod ſixteen or ſeventeen feet long, a ſtout whalebone top, as thick as the upper part of your little finger, and a ſtrong line not quite ſo long as your rod. The ſnap-hook may be thus made. When it is to be placed at the end of your line, take twelve inches of gimp, and two large Salmon hooks, and turn them back to back. In the middle place the gimp, and whip them together with ſilk well waxed: then place a Pearch hook between the other two, and faſten it towards the upper part of the ſhanks with waxed ſilk. At about eighteen inches from the bottom of your line, put on a large float of cork, and under it as much lead as will poiſe it. Fix your bait to the ſmall hook, by running it under the back fin, (the beſt are Gudgeons, Dace, and ſmall Roach) and let it ſwim down the current. When your float is drawn under water, give a ſtrong jerk, and when you find you have hooked your fiſh, play him properly, and uſe the landing net.

TROLLING differs from ſnapping, in this, that the head of the bait fiſh muſt be at the bent of the hook, and that you muſt give the fiſh time to pouch or ſwallow the bait. Trolling hooks, which differ much from thoſe for the ſnap, are to be bought ready made at the tackle ſhops, and therefore need no deſcription.

ANGLING BY HAND is of three ſorts, which we ſhall proceed to deſcribe ſeparately.

The firſt, with a line about half the length of the rod, a good weighty plumb, and three hairs next the hook, which is called a Running Line, and with one large brandling, or a dew worm of a moderate ſize, indeed, with almoſt any worm whatever; for, if a Trout is in the humour to bite, there is hardly any worm he will refuſe. If you fiſh with two worms, you are then thus to bait your hook. Firſt run the point of your hook in at the very head of your firſt worm, and ſo down through his body till it be paſt the knot, and then let it out. Slip the worm above the arming, that you may not bruiſe it with your finger till you have put on the other, by running the point of the hook in below the knot, and upwards through his body towards his head, till it be juſt covered with the head, which being done, you are then to ſlip the firſt worm down over the arming again, till the knots of both worms meet together.

The ſecond way of angling by hand, and with a running line, is with a line ſomething longer than the former, and with tackle made in this manner. At the extremity of your line, where the hook is always placed in all other methods of angling, you are to have a large muſket bullet, into which the end of your line is to be faſtened with a peg or pin even and cloſe with the bullet. About half a foot above that, muſt be a branch of line, of about half a yard long for a ſwift ſtream, with a hook at the end, baited with worms; and, at about half a foot above that, another branch of line, armed and baited after the ſame manner, but with another ſort of worm. Both theſe ways of angling at the bottom are moſt proper for a dark and muddy water, becauſe in ſuch a condition of the ſtream, a man may ſtand as near as he will, and neither his own ſhadow, or that of his tackle, will hinder his ſport.

The third way of angling by hand, with a ground bait, and by much the beſt of all others, is with a line full as long, or a yard and a half longer than your rod, with no more than one hair next your hook, and for two or three lengths above it. There muſt be no more than one ſmall pellet for your plumb, your hook little, your worms of the ſmaller brandlings well ſcoured, and only one upon your hook at a time, which is thus to be baited. The point of your hook is to be put in at the tag of his tail, and run up his body quite over all the arming, and ſtill ſtripped on an inch at leaſt upon the hair, the head and remaining part hanging downwards. With this line and hook thus baited, you are to angle in the ſtreams, always in a clear rather than a troubled water, always up the river, throwing out your worm before you, with a light one-handed rod, like an artificial fly, where it will be taken ſometimes at the top, or within a very little of the ſurface of the

water, and almoſt always before the light plumb can ſink it to the bottom. Provided the rod is light and pliant, and true and finely made, a ſkilful hand will do wonders; and in a clear ſtream, it is undoubtedly the beſt method of angling for a Trout or Grayling.

Some PARTICULARS not generally known by YOUNG ANGLERS.

THERE are particular methods of making baits more agreeable to fiſh than what are commonly practiſed; and, though the uſe of oils, ointments, &c. are by many anglers treated with contempt, it is nevertheleſs certain, from repeated experiments, that the following have been known to contribute greatly to the ſport, at the very time, and on the ſame ſpot, when others, who deſpiſed the uſe of them, could catch nothing.

Anoint a little box with two or three drops of the oil of ivy berries, made by expreſſion or infuſion. Put your worms into this box about an hour or two before you uſe them, and they will acquire a ſmell, which is irreſiſtibly attractive, and will force any fiſh within the ſmell of them to bite.

Some have diſſolved gum of ivy in oil of ſpike, and therewith anointed a dead bait for a Pike, when the fiſh has followed it with more than common eagerneſs. And others affirm that any bait anointed with the marrow of the thigh bone of a herne is a great temptation to any fiſh.

Camphire put with moſs into your worm bag with your worms, makes them, if many anglers are not very much miſtaken, a tempting bait.

The roe of a Salmon or Trout is ſaid to be an excellent bait. You may preſerve it, by ſprinkling it with a little ſalt, and laying it upon wool in a pot, one layer of wool, and another of ſpawn.

To know at any time what bait fiſh are apt to take, open the belly of the firſt you catch, and take out his ſtomach very tenderly: open it with a ſharp penknife and you will diſcover what he fed on.

RULES and CAUTIONS to be obſerved by YOUNG ANGLERS.

WHEN you have hooked a fiſh, never ſuffer him to run out with the line; but keep your rod bent, and as nearly perpendicular as you can. By this method, the top will ply to every pull he ſhall make, and you will prevent the ſtraining of your line.

For the ſame reaſon, never raiſe a large fiſh out of the water, by taking the hair to which your hook is faſtened, or indeed any part of the line into your hand; but either put a landing net under him, or, for want of that, your hat. You may, indeed, in fly-fiſhing, lay hold of your line to draw a fiſh to you; but that muſt be done with great caution.

Your ſilk for whipping hooks, and other fine work, muſt be very ſmall. Uſe it double, and wax it, and indeed any other kind of binding will do with ſhoemakers wax, which of all wax is the toughеſt and holds beſt. If your wax is too ſtiff, temper it with tallow.

Incloſe the knots and joints of your lines in a ſmall pill of wax, preſſed very cloſe, and the ſuperfluities pinched off. This will ſoon harden, and prevent the knots from drawing.

If for ſtrong fiſhing you uſe graſs, which, when you can get it fine, is to be preferred to gut, remember always to ſoak it about an hour in water before you uſe it: this will make it tough, and prevent its breaking.

When you begin fiſhing, wet the ends of the joints of your rods, which, as it makes them ſwell, will prevent their looſening.

If you happen, with rain or otherwiſe, to wet your rod, ſo that you cannot pull the joints aſunder, turn the ferrel a few times round in the flame of a candle, and they will eaſily ſeparate.

Before you fix the loop or briſtle to your hook, in order to make a fly, to prevent its drawing, be ſure to ſinge the end of it in the flame of a candle. Do the ſame by a hair, to which at any time you whip a hook.

Make flies in warm weather only; for in cold your waxed ſilk will not draw.

In rainy weather, or when the ſeaſon for fiſhing is over, repair whatever damage your tackle has ſuſtained.

Never regard what bunglers and ſlovens tell you; but believe that neatneſs in your tackle, and a nice and curious hand in all your works, eſpecially in fly-making, are abſolutely neceſſary.

Never fiſh in any water, that is not common, without leave of the owner, which is ſeldom denied to any but thoſe who do not deſerve it.

If at any time you happen to be overheated with walking, or other exerciſe, avoid ſmall liquors, eſpecially water, as you would poiſon; but rather take a glaſs of rum or brandy, the inſtantaneous effects whereof, in cooling the body, and quenching drought, are amazing.

A

NEW, COMPLETE, and UNIVERSAL BODY, or SYSTEM of

NATURAL HISTORY;

Being a Grand, Accurate and Extenſive

Diſplay of Animated Nature.

BOOK V.

Containing the Natural Hiſtory of VEGETABLES,
As well FOREIGN *as* INDIGENOUS,
WITH AN ACCOUNT OF
Their ROOTS, BARKS, WOODS, LEAVES, FLOWERS, FRUITS, SEEDS, RESINS, GUMS, and Concreted JUICES;
AS ALSO
Their Properties, Virtues, and Uſes in MEDICINE; together with the Method of Cultivating thoſe planted in GARDENS:
INCLUDING LIKEWISE
OBSERVATIONS on HOT-BEDS, and WATERING of PLANTS.

INTRODUCTION.

THE ſcience of Vegetables may, with propriety, be divided into three claſſes: the firſt conſiſts of the order of their arrangement in the botanical nomenclature; the ſecond, of their culture; and the third of their properties. The two firſt, while they ſerve to amuſe and delight us, enable us more readily to comprehend the laſt, which is the only one of real importance, and which claims our moſt ſerious attention.

However neceſſary the proper arrangement of the various ſpecies of Vegetables may appear, it is very certain, that the immenſe labours, which ſome late botaniſts have undergone, to give us a liſt of the names of plants, can contribute very little to the diſcovery of their properties. We ſhould be led to ſuppoſe, from the repeated endeavours to ſyſtematiſe this ſcience, that the whole of the ſtudent's purſuit was directed to acquire the names of plants. More time has been conſumed in making catalogues of this nature, than, if properly applied, would have been ſufficient to acquire a tolerable knowledge of the ſcience, and perhaps have enabled the botaniſt to diſcover ſeveral new properties in the vegetable world, as yet unknown.

Numberleſs efforts have been made to impreſs diſtinct ideas of each plant, without fully deſcribing them; but every botanical ſyſtem has hitherto failed in this particular, ſince nothing but a perfect deſcription of each can give an adequate idea. For this reaſon, leaving ſuch ſyſtems to the ſpeculative, we ſhall, in the following work, purſue the common method, and give a perfect account of every Vegetable in uſe, its roots, leaves, ſtalk, height, flower, and ſeeds. Such compleat diſtinctions are abſolutely neceſſary to diſtinguiſh one object from another, throughout every department of Natural Hiſtory, but particularly in this, where the objects are ſo numerous. The deviations of Nature are not to be reduced into ſyſtems: almoſt every plant, even of the ſame ſpecies, has its variations, this year differing, in ſome reſpects, from what it was the laſt.

Let us then, without paying any regard to ſyſtematical arrangement, treat this ſubject in the manner of the ancients, ſuch as Pliny and Ariſtotle. Thoſe, that have been already uſeful to mankind, we ſhall take particular care minutely to deſcribe, and leave poſterity and chance to find out the uſes of others now unnoticed. But, before we proceed in this undertaking, it may not be improper to take a ſurvey of Vegetables in general.

In every vegetable production, we may conſider either the ſeed, the root, the leaf, the bark, the ſtalk, the

the pith, and the flower: all which are neceſſary in carrying on the buſineſs of vegetation, and tranſmitting the ſpecies, from ſeaſon to ſeaſon, without interruption. Though the principles of vegetation reſide in every part of the plant, yet we generally find greater proportions of oil in the more elaborate and exalted parts of Vegetables, that is, in the ſeed. As this contains the rudiments of the future Vegetables, it was neceſſary that it ſhould be well ſtored with principles, that would preſerve the ſeed from putrefaction, and tend to promote vegetation. When the ſeed is ſown, in a few days, it imbibes ſo much moiſture as to ſwell, and thus it produces the radicle, or incipient root, with ſome force, which, when ſhot into the ground, imbibes nouriſhment from thence, and what it receives becomes, in a ſhort time, the chief ſupply of future growth. When the root is thus far grown, it ſupplies the plume with nouriſhment, till this, by expanding and growing thinner, turns to green leaves, which are of ſuch importance to the incipient plant, that it periſhes, and will not thrive, if they are pulled off; but when the plant is ſo far come to maturity, as to have branches and expanded leaves to draw up nouriſhment, the ſeminal leaves, being no longer uſeful, ſoon periſh, their perſpiration being immediately impeded by the newly produced leaves that overſhadow them, and their ſap being drawn away by the larger channels of the upper foliage.

As the plant advances in ſtature, the firſt, ſecond, third, and fourth order of lateral branches ſhoot out, each lower order being larger than thoſe immediately above them, not only on account of their having a longer time to grow, but becauſe, being inſerted in larger parts of the trunk, and nearer the root, which is the grand ſupply, they are provided with greater plenty of ſap: hence we frequently ſee trees beautifully tapering to the top.

As ſoon as the circulation of the blood in animals was diſcovered, botaniſts began to think. from the analogy there was between all the works of Nature, that the ſame circulation muſt alſo prevail in Vegetables; and ſome have actually undertaken to prove, that the ſap firſt riſes to the tops of trees by means of the pith, and then deſcends to the root by the bark, with the ſwifteſt motion. That great naturaliſt, Dr. Hales, undertook by experiments, to confute this opinion; but, without entering into a detail of that gentleman's opinion, or that of Mr. Du Hamel, thus far we may venture to conclude, as a certain fact, that there is a conſtant flow of juices through every plant, the root furniſhing it with great quantities, while the leaves, ſpreading an extended ſurface to the ſun, have their moiſture attracted in very large quantities; and, when the influence of his beams no longer continue, they at night act as ſponges, and imbibe the humidity of the air. Thus we ſee, that the leaves are abſolutely neceſſary in the works of vegetation: they, like young animals, are furniſhed with inſtruments to ſuck it from thence, and, beſides this, they ſeparate and carry off the redundant watery fluid, which, by being long detained, would turn rancid, and become fatal to the plant.

As the leaves are found to exhale moiſture, ſo they are known to imbibe nouriſhment from the air. The acid and ſulphureous ſpirit, with which the air abounds, is thence extracted by the leaves of plants: ſo that it is probable, the moſt exalted and aromatic principles of Vegetables are derived from this ſource, rather than from the groſſer watery fluid of the ſap. Leaves are found to perform, in ſome meaſure, the ſame office for the ſupport of vegetable life, that the lungs of animals do for the ſupport of animal life; but, as plants have not the power of contracting or dilating the cheſt, their inſpirations will depend wholly on the alternate changes of the air. The vine is known, from repeated experiments, to draw but little watery nutriment from the earth by its roots, and therefore it imbibes greater quantities of dew, impregnated with air by night, from whence it derives its richneſs of flavour. It is probable, that this may be the reaſon, why plants in hot countries abound more with fine aromatic principles, than northern Vegetables: the former chiefly extract their juices from the air by the leaf, the latter theirs from the earth by the root.

Nothing can exceed the regularity, with which leaves are placed on every plant; but the care which Nature ſeems to take of the young ſhoots when budding, ſtill deſerves greater admiration; for the moſt tender ſhoots are ever nouriſhed by thoſe, which have acquired a greater degree of ſtrength. Beſides this, the leaf, as every one knows, has two different ſurfaces: the upper, which ſeems more ſmooth and poliſhed; the lower, in which the ribs are more prominent, and of the colour of a paler green. The cauſe of this difference has not a little puzzled the botaniſts of every age: perhaps, the upper poliſhed ſurface, from its poſition, being more expoſed to the external injuries of the air and rain, is thus formed rather to defend the lower part, in which, probably, the attractive powers may reſide. In this manner, the leaves of trees contribute to improve the flavour of the fruits, and regulate the vegetation.

The aſſiduity of Nature, in the production of growing plants, is not greater than her care to preſerve the ſeeds, which are to propagate the future Vegetables. The curious expanſion of bloſſoms and flowers ſeem to be appointed by Nature, not only to protect, but alſo to convey nouriſhment to the embryo ſeed, and the fruits in general ſerve to ſupply the ſeeds with moiſture.

When trees ſtand thick together in woods or groves, the lower branches, being ſhaded by thoſe of the neighbouring trees, can perſpire little, and imbibe leſs, on which account they periſh; but the top branches, being expoſed to a free air, perſpire plentifully, and by this means drawing the ſap to the top, advance in height rather than extent. Dr. Hales compares a tree to a complicated engine, which has as many different powers of attraction, as it has arms or branches, each drawing from their common fountain of life, the root. The younger the plant, the greater is its power of attraction; but, as it grows older, the veſſels of circulation become more rigid, it ceaſes to puſh out its tender branches, and the whole plant, from the rigidity of age, acquires its greateſt degree of hardneſs, when it ceaſes to vegetate.

Though fruits in general are the moſt inconſiderate agents in promoting the work of vegetation, being, as is commonly ſuppoſed, only deſtined to ſupply the ſeed with proper moiſture and nouriſhment; yet, with reſpect to man, they make the moſt uſeful and pleaſing part of vegetable productions. Their general properties, as conſtituting a part of our food, may be conſidered as ariſing from their different degrees of maturity. In general, while unripe, they may be conſidered as aſtringent, and in ſome meaſure partaking of the qualities of the bark of their reſpective trees: when come to a ſufficient degree of maturity, they cool and attenuate; but, from too great a power in theſe reſpects, they often bring on diſorders that are fatal in warm climates, where their juices are poſſeſſed of thoſe qualities much more than with us. In our climates, however, this ſeldom happens, and they probably do not make a ſufficient part of our diet.

As to the increaſe of plants, ſome proceed from ſeeds only, others from ſeeds and ſuckers; as tulips, for inſtance, which have ſeeds in their piſtils, and a large quantity of ſmall ſuckers, which riſe, in a numerous progeny, round the parent plant. Some are

are propagated and brought to perfection by grafts, which are no more than ſmall branches of the fineſt ſort artfully inſerted in an aperture, made in the wood or bark of ſome wild or ordinary plant; while others are multiplied by ſlips. The ſtrawberry plant throws out two long fibres on each ſide, the knots whereof take root in the earth, and become ſo many new ſtems. The branch of a vine bowed down, and thruſt into the earth, ſhoots out fibres through the knots that lie buried and concealed; cut the branch off where it joins with the ſtock, and the other end, which riſes out of the ground, becomes a new vine. In ſhort, there are plants, which proceed from little ſlips or twigs of trees, when ſet in the ground, without any other manual operation.

There is no difficulty in accounting for the two firſt; becauſe a ſeed, or a ſeed and a ſucker, contain in them a ſhoot, or a minute plant complete. The graft, likewiſe, containing its buds for leaves, as well as fruits, the ſap, when it flows into it, not only gives, but diſcovers what the graft contains. Let us now proceed to what at firſt ſight ſeems more difficult to be accounted for, the increaſe from ſlips of trees. When we ſet a ſlip into the ground, the ſap, which overflows it, puts ſome of thoſe ſhoots in motion, which are to produce new branches. The little ſuckers, which expand themſelves on each ſide, are, by the preſſure of the earth upon them, prevented from riſing with eaſe into the air. The juice, which aſcends into the ſtem, coming afterwards to flow back, and deſcend upon the ſame ſuckers in the earth, take their courſe downwards inſtead of upwards, and become roots inſtead of branches. From whence we may conclude, that the ſtem gives only a paſſage to the ſap and the air, and that the ſap and air give nutriment and motion to all the ſhoots; that theſe ſhoots are produced before-hand, and are perhaps wrapped up in one another, as they were from the beginning of the world, for the benefit and advantage of mankind, through the ſucceſſion of all ages.

We muſt not quit our conſiderations on Vegetables, without paying particular reſpect to flowers, which are formed to pleaſe us, and for our delight have received their amiable appearances: no eye but ours can enjoy their beauties: common animals never ſeem to be affected with pleaſure when they behold them, nor do they ever ſtop to contemplate their wonders. They confound them with the common herbage of the field, they trample on the moſt beautiful of the tribe, and are perfectly inſenſible of this ornament of the earth. Whereas man, amidſt a crowd of objects and riches that ſurround him, diſtinguiſhes and purſues the flowers with a peculiar complaiſance.

Flowers have likewiſe an agreeable correſpondence with our eyes, and a ſet of powerful attractions that invite us to approach them. Whenever we gather them, they preſent us with new perfections, in proportion to our regarding them with nearer attention. The greateſt part of them not only regale our view with the beauty and arrangement of their colours, but gently delight our ſmell with an exquiſite perfume; and, when they have gratified our ſenſes with an innocent ſatisfaction, the mind ſtill diſcloſes wonders in them, which raviſh its faculties.

When we carefully ſurvey the ſtructure of a flower, in order to diſcover its relation with the ſeed, we always find one or more incloſures appointed for the reception of the ſemen. Around that incloſure is a ſet of chives ſuſtaining ſeveral packets of powder, which they ſcatter on all parts. The whole is encompaſſed with an empalement, or ſoft robe, that unfolds and cloſes, with a kind of precaution, according to the diſpoſition of the air. All theſe things convince us, that theſe parts, which are diſpoſed with ſo much art and regularity, and wither round the incloſure, when the ſeed is formed, are inſtrumental in the generation of that ſeed.

It is difficult to conceive, how far the deſign, to delight man with the beauty and profuſion of flowers, has been extended. Their multitude is a real prodigy, and we are led to imagine, that they had been commanded to ſpring beneath every ſtep we take. They rear their heads on the lofty tops of trees, and are diffuſed through the herbage that creeps along the earth; they embelliſh the valleys and the mountains, and the meadows are enamelled with their colours; they are gathered from the ſkirts of woods, make their appearance even in deſerts, and the earth is a garden entirely covered with their bloom. The proſpect they afford us is ſo pleaſing, that the generality of thoſe arts, which are ambitious to pleaſe, ſeem moſt ſucceſsful when they borrow the aſſiſtance of flowers: ſculpture imitates them in its ſofteſt ornaments, architecture courts the embelliſhments of leaves and feſtoons on thoſe columns and fronts, which would otherwiſe be too naked: the richeſt embroideries are little more than foliage and flowers; the moſt magnificent ſilks are almoſt covered with theſe charming forms, and are thought beautiful in proportion as they reſemble the lively tinge of natural flowers.

Flowers are not only intended to beautify the earth with their ſhining colours, but the greateſt part of them, in order to render the entertainment more exquiſite, diffuſe a fragrance that perfumes all the air around us; and it ſhould ſeem as if they were ſolicitous to reſerve their odours for the morn and evening, when walking is moſt agreeable; but their ſweets are very faint during the heat of the day, when we viſit them the leaſt. Let us endeavour to account for this.

The ſap is perpetually tranſpiring through the flowers, in proportion to the ſun's warmth. Theſe fine ſpirits, which are the eſſence and aromatic parts of the flowers, are eaſily diſperſed through an air rarified by heat, and affect the ſmell but faintly at that time; but their diſſipation is much abated, when the air is condenſed by the return of night. The action of the ſun, by which they are diffuſed, is too weak, in the morning and evening, to ſcatter them to any conſiderable diſtance, and it is then that the reunion of theſe ſpirits affect us with the ſtrongeſt impreſſions. The evaporation of theſe minute particles forms an atmoſphere around the flower, which is diſſipated or condenſed, as the action of the ſun is more or leſs intenſe.

This is a demonſtration, that the ſpirit of flowers are diſperſed in proportion to the ſun's action upon them; but we will not confine ourſelves to this particular: in the ſtudy of natural things, true philoſophy is never limited to the contemplation of their mechaniſm, but extends its curioſity to the benefits they produce. We are eaſily ſenſible of the intercourſe that appears between the flowers, the air, and the ſun beams; and can we poſſibly be unacquainted with that goodneſs, which is ſo attentive to make this correſpondence advantageous to man? Providence has not only enamelled his way with flowers, for the entertainment of his view, but has taken care to embalm and purify the air he breathes, by ſhedding the nobleſt perfumes in his paſſage.

Their ſervices, however, are not limited to the ſight and ſmell, for other ſenſes may derive advantages from them. They ſupply us with paſtes to enrich our deſerts, and preſent us with powders to perfume our wardrobes; they afford us delicate ſyrups, and even remedies to relieve us, when we are indiſpoſed; violets, jonquils, and peach-bloſſoms, roſes,

roſes, jeſſamines, carnations, and eſpecially orange-flowers, accommodate us with conſerves, and a variety of confections, together with eſſences and diſtilled waters, that continue to us the enjoyment of the odours, and other uſeful qualities of flowers, when they have long ceaſed to be in ſeaſon.

Upon the whole, we may undoubtedly draw this concluſion, that every Vegetable and flower, however lightly and inſignificantly cuſtom and taſte may have taught us to behold it, affords us an ample field of admiration, and cannot fail to inſpire us with the higheſt eſteem and veneration for the great Author of Nature, who has created and formed ſo many things for our uſe and amuſement.

CHAP. I.

Containing the NATURAL HISTORY *of* FOREIGN VEGETABLES, *and their* ROOTS, BARKS, WOODS, LEAVES, FLOWERS, FRUITS, SEEDS, RESINS, GUMS, *and* CONCRETED JUICES.

NATURAL HISTORY of ROOTS.

THE CALAMUS AROMATICUS or *Acorus Verus*, is a ſweet ſmelling flag. It has a long, oblique, knotty root, about as thick as a man's finger, and a little compreſſed; when freſh, it is of a whitiſh green colour; but afterwards turns of a reddiſh yellow. It is white and ſpongy within, has a ſharp bitteriſh aromatic taſte, with a diſtant reliſh of that of garlick, and a fragrant aromatic ſmell.

From the root that lies near the ſurface of the earth, there ariſe leaves, ſome of which are a cubit in length, others half as much, and its peculiar characteriſtic is a ſimple elegant iulus, with leaves like the aromatic flower de luce. They are ſharp at the point, of a pleaſant green, ſmooth, and above a quarter of an inch broad. They have ſix petals, which are blunt, hollow, looſe, thick above, and truncated below. There are ſix thickiſh filaments, a little longer than the corolla. The antheræ are thickiſh, and join to the dedymæ. The germen is gibbous, longiſh, and there is no ſtyle; but the ſtigma is a prominent point. The capſula is ſhort, triangular, and conſiſts of three cells. The ſeeds are of an oblong oval.

The INDIAN ACORUS, by ſome called the true *Aſian Calamus Aromaticus*, has a root not unlike the former, but more tender and of a pleaſanter ſmell; the taſte is bitteriſh, but not diſagreeable. It is found both in the Eaſt and Weſt Indies, and is in ſhape much like the former. It is recommended for inciding cold groſs humours, and ſome pretend it is good againſt poiſons.

ANGELICA is placed by Ray among the umbelliferous herbs with a ſhorter ſeed. The flower, according to Linnæus, is a large convex umbella, and the univerſal corolla is uniform; but the proper conſiſt of five oval concave petals, that are nearly equal to each other. There are five ſimple filaments, and roundiſh antheræ. The germen is beneath the receptacle; there are two ſimple erect ſtyles of the length of the corolla, and the ſtigmata are capitated. The fruit is oval, oblong, ſtreaked, and may be ſeparated into two parts. There are two oval, oblong ſeeds, convex and ſtreaked on the one ſide, and the other plain. The root is three digits thick, with many fibres, black and wrinkled on the outſide, but within, white, ſoft, juicy, ſharpiſh and bitteriſh. The ſtalk grows to two cubits and upwards in height, and is hollow, full of branches, with large leaves like thoſe of meadow ſmallage, but much ſharper. The dried root is brought to us from Bohemia, the Alps, and the Pyrenees. The beſt is thick, of a duſky colour without, whitiſh within, and with a moſt fragrant ſmell, a little inclining to muſk, and of an acrid aromatic taſte. The roots brought from Spain, are now very ſeldom preſcribed upon any occaſion. Our own candied Angelica roots are well known to every one as a ſweetmeat.

ANTHORA, in Engliſh, *Monk's-hood*, or *wholeſome Wolf's Bane*, is the *Aconitum* of Tournefort. The flower has five unequal petals ſet oppoſite to each other in pairs, the uppermoſt of which is galeated with its back turned upward, the point ſharp, and reflected towards the baſe. The two on the ſides are broad, roundiſh, and connivent; but the lowermoſt two are oblong, and turned downwards. The colour is of a paliſh yellow, and the piſtil turns to a fruit, in which are collected, as into a head, corniculated membranaceous ſheaths, full of angular wrinkled blackiſh ſeeds. The plant is generally about nine inches high, and ſometimes it is above a cubit, with a ſingular ſtiff angular hairy ſtalk, on which the leaves are ſet alternately, are whitiſh below, and have a bitteriſh taſte. The virtues of this plant are uncertain, and ſome think the uſe of it is dangerous.

ARISTOLOCHIA is of ſeveral kinds, as the round, the long, the clematitis, and the ſlender. *Ariſtolochia Rotunda*, or *Round Birthwort*, according to Linnæus, has a ſingle unequal petal, with a ventricous baſe, and conſiſts of an oblong tube of a hexagon cylindrick ſhape, and a broad edge, extended downwards like a long tongue. There are ſix antheræ joined to the lower part of the ſtigmata, and the germen is oblong, angular, and under the receptacle. There is ſcarce any ſtyle, and the ſtigma is roundiſh, concave, and divided into ſix parts. The capſula is large, hexangular, and conſiſting of ſix cells. There are many flat ſeeds, and the fruit is round. It conſiſts of a great number of ſtalks proceeding from a ſingle root, which are a cubit high, and the leaves are placed alternately on the ſtalks, almoſt without any pedicle. They are roundiſh, of a duſky green colour, and, as it were, embrace the ſtalks. The flowers proceed from the wings, the root is tuberoſe, ſolid, three inches thick, roundiſh, wrinkled, with a few fibres duſky on the outſide, of a paliſh yellow within, and covered with a thick bark: the taſte is acrid, aromatic, and bitteriſh.

ARISTOLOCHIA LONGA, *Long Birthwort*, has the ſame ſort of flower as the former, only it is of a whitiſh green colour within, and outwardly of an herbaceous colour. The fruit is terminated like a top, and when it is ripe it gapes, ſhewing a broad reddiſh ſeed, which at length turns to a duſky colour. The root is oblong, and about an inch thick, though ſometimes it grows to the thickneſs of a man's arm; it is wrinkled, and of a duſky colour without,

without, but within it is yellowiſh, and the taſte is ſomewhat more faint than the former.

ARISTOLOCHIA CLEMATITIS has a long creeping root, divided into ſeveral fibres; it is ſeldom thicker than a gooſe quill, is duſky without, and yellowiſh within; and has a bitter taſte, with a ſmell ſtronger than the former. The ſtalks are a cubit in length, and are rounder, harder, and ſtronger than thoſe of the former; likewiſe the leaves are larger, full of veins, and of a pale green colour, with longer pedicles than the reſt. The flowers are pale, ſhaped like thoſe of *round Birthwort*, but leſs, and the fruit is like that of *long Birthwort*, but bigger, they being of the ſize of ſmall apples; likewiſe the ſeeds are larger.

ARISTOLOCHIA TENUIS, *ſlender Birthwort*, otherwiſe called *Piſtilochia*, has a root which conſiſts of long ſlender filaments, meeting in one head of a yellowiſh colour, with an aromatic ſmell, and an acrid bitter taſte. The ſtalks are about nine inches high, and ſlender. They are angular and ſtreaked, and full of branches, with the leaves more pointed than the *round Birthwort*, but leſs wrinkled, and a little ſinuous on the edges. The flowers are like thoſe of the *round Birthwort*, but leſs, and ſometimes black; but at others they are of an herbaceous yellowiſh colour, with fruit like thoſe of the round. When they are ripe, they gape at the part next the pedicle, and the ſeeds are like thoſe of the *round Birthwort*.

All the kinds are reckoned to be opening and a little cleanſing, and ſome eſteem the round ſort as beſt. They are ſaid to be good againſt catarrhs and diſorders of the breaſt from groſs humours; as alſo againſt wind, pains of the cholic, and obſtructions of the viſcera.

BEHEN ALBUM, *white Behen*, is a root which is brought to us in pieces about as thick as a man's finger; of an aſh colour without, with a contracted wrinkled ſurface, but pale and pulpy within, and of an acrid taſte.

BEHEN RUBRUM, *red Behen*, is a root brought to us in pieces like jalap, and is dry, thick, and of a blackiſh red colour, with a taſte and ſmell like the former, but more faintiſh. They are both brought from Syria and other places. It has a long geniculated root without hairy fibres, and is creeping like Liquorice, which it reſembles both in ſhape and thickneſs; but it is whiter on the inſide.

BUTUA, or *Pareira brava*, is a Braſilian plant, and the root is woody, hard, contorted, duſky, and wrinkled without, as well lengthways as circularly; within it is of a duſky yellow, and ſeems to be interwoven with various fibres; ſo that when it is cut tranſverſely, they appear like ſo many concentric circles, with ſeveral rays or fibres reaching from the center to the circumference. It is without ſmell, but of a bitteriſh taſte, with a ſweetneſs not unlike liquorice. It is as thick as a man's finger, and ſometimes as a child's arm.

It is good in ulcers of the bladder and kidnies, and, when mixed with a little balſam of capivi, it will certainly cure them. Some ſay it is an excellent remedy in a moiſt aſthma, and the yellow jaundice. The doſe is from twelve grains to thirty in ſubſtance; and from two drachms to three in decoction.

CARLINA, or *Chamælion albus* of the ſhops, is a root a palm or two in length, and of the thickneſs of a man's thumb; it is red without, and has a ſurface which ſeems to have been corroded; it is white within, with an acrid aromatic taſte, and a fragrant ſmell. It is brought from the Alps and Pyrenees, and ſhould be choſen freſh, dry, and not carious.

CASUMUNAR is an Eaſt Indian root, and is tuberoſe. It is thicker than a man's thumb, and is cut into tranſverſe pieces; it is marked on the ſurface with circles like galangal, and is a little geniculated. It is aſh coloured without, yellowiſh within, with a ſubacrid, bitteriſh, aromatic taſte. What plant this belongs to is uncertain; however it is ſaid to ſtrengthen the nerves, refreſh the ſpirits, corroborate the ſtomach, and repel wind. It is given in ſubſtance from ten grains to thirty, and the tincture from twenty drops to thirty. The extract is alſo given from ſix grains to fifteen; but the chief uſe made of it is to help digeſtion and diſpel wind.

CHINA is a long root, and is ſo called from the place it is brought from. However, there are now two ſorts, one of which is brought from the Eaſt, and the other from the Weſt Indies. It is a thick arundinacoues, geniculated, heavy, woody root, beſet with unequal tubercles, and the colour without is of a duſky red, but within of a reddiſh white. The taſte while freſh is a little acrid, but when dry it has a ſmall degree of an earthly aſtringent taſte, and without ſmell; if it is good, it ſeems to be fat and unctuous when chewed. The plant to which it belongs is called the rough Chineſe ſmilax, or bind weed. The medicinal uſe of this root is now but little regarded. The American China differs from the former, only it being of a darker colour without, and redder within.

CONTRAYERVA is a root an inch or two in length, and about half an inch thick, and is knotty on the outſide; it is hard, thick, reddiſh or blackiſh without, wrinkled, and the protuberances are, as it were, covered with ſcales; it has alſo many ſlender filaments, or threads, but within it is pale, and has a ſomewhat aſtringent bitteriſh taſte, with a ſweet ſort of acrimony when it has been held long in the mouth. The tuberoſe part is only to be choſen; for the filaments are of no value. It grows in ſeveral parts of the Weſt Indies, and is brought to us from Spain. It is a mild alexipharmic, and has been counted excellent againſt all ſorts of coagulating poiſons. It ſtrengthens the ſtomach, helps digeſtion, and diſcuſſes wind; it is alſo uſed by ſome in malignant fevers. The doſe is generally a ſcruple; but it may be given to a drachm and upwards. It is certainly very good to promote a diaphoreſis.

COSTUS is by authors ſaid to be of various kinds; but that in uſe with us is the ſweet Coſtus of the ſhops, and is brought from the Eaſt Indies. It is cut into oblong pieces, which are about the thickneſs of a man's thumb; which are light and porous, but hard and brittle, and a little reſinous. Sometimes it is whitiſh, and ſometimes of a yellowiſh aſh colour, with an acrid aromatic bitteriſh taſte; but the ſmell is fragrant, and not unlike that of violets. It is ſaid to attenuate viſcid humours, to promote expectoration, and is by ſome reckoned a cephalic, as well as to be good for promoting a diaphoreſis and urine; but it is very ſeldom uſed.

CURCUMA, *Turmeric*, is a root brought from the Eaſt Indies, and is oblong, ſlender, tuberoſe, knotty, and of a yellow or ſaffron colour; the taſte is ſubacrid and bitteriſh, with a ſmell like that of ginger, but weaker. It is a very uſeful root to the dyers; and, as it is very much in requeſt, there is ſcarce a garden in the Eaſt Indies where it is not cultivated: they uſe it with their victuals as a ſort of ſpice. It is recommended againſt obſtructions of the lungs, liver, ſpleen, meſentery, and womb; but its principal virtue is againſt the jaundice, in which it is looked upon as a ſpecific. It is given in ſubſtance from a ſcruple to a drachm, and in infuſion to two drachms.

CYPERUS LONGA, *long Cyperuſs*, is a long ſlender knotty contorted root, not eaſily broken; it is blackiſh without, and whitiſh within; and of a ſweet ſubacrid aromatic taſte, with a fragrant ſmell like that of nard. It is generally brought to us from Italy, and care ſhould be taken that it has a lively ſmell, and is not carious. There is another root called

round Cyperuſs, which has been brought from the Levant, and is a roundiſh and turbinated root, of the ſize and ſhape of an olive. It is rough, ſtreaked, reddiſh without, and ſometimes black; but it is white within, and there are ſeveral fibres depending from a ſingle head. The ſmell and taſte are the ſame as the former. Many virtues have been attributed to it; but in the preſent practice it is ſeldom uſed.

DICTAMNUS CRETICUS, *Dittany of Crete*, is a kind of Origany, and is now only uſed in venice treacle; it is brought to us from Candy, and is ſaid to grow on mount Ida. There is another ſort called *white Dittany*, which is a ſort of Fraxinella, now of ſome uſe in many parts of Europe. The root, or rather bark of the root, is thickiſh, white, and is generally brought to us wrapped up in the ſame manner as cinnamon; it is of a bitteriſh taſte with a little acridity, and has a fragrant, and pretty ſtrong ſmell when freſh. It is ſaid to be an alexipharmic, to promote ſweat and urine, to kill worms, and to reſiſt putrefaction. The doſe is from half a drachm to two drachms in ſubſtance, and in infuſion to an ounce.

DORONICUM ROMANUM, *Roman Wolfsbane*, is a tuberoſe root full of knots and tubercles, which are hardly ſo big as ſmall hazel nuts; it is yellowiſh without, and whitiſh within, and the taſte is ſweetiſh, clammy, and a little ſtyptic. It is brought to us from the Alps. As the qualities of this root are not perfectly known, it is not adviſeable to admit it into practice.

GALANGA MINOR, *the leſſer Galangal*, is a tuberoſe, knotty, geniculated root, and is divided into branches, as well as encompaſſed with circular rings; is uneven, hard, ſolid, and about as thick as the little finger; of a duſky colour without, and reddiſh within; with an acrid, aromatic, bitter, pungent taſte, burning the mouth like pepper or ginger, and has an aromatic or fragrant ſmell while it is freſh: it is uſed in the Eaſt Indies as a ſpice. It is a warm ſtomachic bitter, and is given to promote digeſtion. It is good to diſcuſs wind, and in all diſorders that proceed from a weak ſtomach. The doſe is from fifteen grains to thirty in ſubſtance, and from half a drachm to two drachms in infuſion.

GENTIANA, *Gentian*, is a root ſometimes a foot in length, and near an inch in diameter, but ſometimes more; it is duſky on the outſide, but of a yellowiſh red within, and a taſte intenſely bitter; likewiſe the ſubſtance is a little ſpongy. It grows among the Alps, Pyrenees, and other mountains, and is brought to us from Germany. Not many years ago there was a poiſonous root ſold inſtead of Gentian; but it may be readily diſtinguiſhed from it, it being of a whitiſh colour within, and without its bitter taſte. Gentian is uſually preſcribed as a bitter to ſtrengthen the ſtomach, and to help digeſtion. The doſe is from half a drachm to two drachms.

GLYCYRRHIZA, *Liquorice*, is a root extremely well known almoſt to every body. The ſtalks, riſe to three or four cubits in height, and are divided into ſeveral branches, with roundiſh leaves of a faint green colour. They ſtand upon the ſtalks by pairs, that is, one on each ſide, but at the end there is one that is ſingle. The flowers are papilionaceous, ſmall, blueiſh, and at the top diſpoſed as it were into a ſpike. The piſtil that riſes from the calyx turns into a reddiſh pod, half an inch long, which has two valves and a ſingle cell containing the ſeeds, which are ſmall, hard, flat, and in the ſhape of kidnies.

Liquorice grows ſpontaneouſly in Spain, Italy, France, and Germany, and is alſo common with us in England. The root temperates ſalt acrid humours, and is good in diſeaſes of the breaſt. It is often preſcribed in decoctions, as well to appeaſe the heats of the fluids as to abate their acrimony. As for the doſe, it is not eaſily determined; for it is uſually chewed by children in large quantities without any bad conſequence. The inſpiſſated juice, which is brought from Spain, is of a blackiſh colour, and is commonly called Spaniſh liquorice: it has the ſame virtue as the root, but ſtronger.

HELLEBORUS ALBUS, *white Hellebore*, is an oblong tuberoſe root, ſometimes as thick as the thumb, duſky without, and white within, with a great number of whitiſh fibres; the taſte is acrid, a little bitteriſh, ſubaſtringent, diſagreeable and nauſeous. The inward uſe is not very ſafe; nor indeed the outward; for when the powder is applied to an iſſue it will occaſion violent purging. When taken inwardly, it is a ſtrong emetic, and has been obſerved ſometimes to occaſion convulſions and other terrible diſorders. However, in deſperate caſes, it may be ſometimes ventured upon, particularly againſt madneſs; and the doſe in this diſeaſe is a ſcruple: it ought always to be uſed with the utmoſt caution.

HELLEBORUS NIGER, *black Hellebore*, is a tuberoſe, knotty root, from which as a head many fibres hang, which are thick and black without, but white within, and of an acrid bitteriſh taſte; the ſmell while freſh is exceeding ſtrong. The inward uſe of this is much ſafer than the former, and is accounted a proper purge againſt melancholic and atrabilarious diſorders. It acts particularly on the ſtrait gut, for which reaſon it promotes the piles.

HERMODACTILUS, *Hermodactyl*, is a hard tuberoſe triangular root, or rather in the ſhape of half a heart, it being flat on one ſide, and tuberoſe on the other, terminating as it were in a point; it is reddiſh without, white within, and is eaſily reduced into a meal by pounding; it is of a clammy ſweetiſh taſte, with a ſlight acrimony. Hermodactyls are always dried when they are brought to us, and have been thought to purge groſs humours, particularly of the joints, whence they have been eſteemed as excellent in the gout; however, their purgative quality is but weak. It is given in ſubſtance from half a drachm to two, and in decoction to an ounce; but it is ſeldom or never uſed alone.

JALAPA, *Jalap*, is an oblong turbinated thick denſe root, cut into tranſverſe pieces, and is heavy and blackiſh without, but within duſky or aſh coloured. It is reſinous, hard to be broken, and has a taſte that is ſomething acrid and nauſeous. It is the root of an American convolvulus, and is called by ſome Mexican night-ſhade with a large flower. It is in great uſe as a purge, and is of the ſtronger ſort, though it ſeldom or never produces any bad conſequences. It is beſt given in ſubſtance, becauſe then it operates beſt; for the reſin is apt to occaſion gripes, and the watery extract is too weak. It is very uſeful in a cold phlegmatic habit of body; but is not at all proper in feveriſh diſorders, nor in hot and dry conſtitutions, nor yet in melancholic, or ſcorbutic diſorders. A ſcruple is the uſual doſe to grown perſons.

IMPERATORIA, *Maſter-wort*, is not the ſame plant called by that name with us, for it is brought from the Alps and Pyrenean mountains; and is an oblong root as thick as a man's thumb, and wrinkled: it is ſomewhat geniculated, is duſky without, and white within, with a very acrid aromatic taſte, violently vellicating the tongue, and heating the mouth; it has a moſt fragrant ſmell, but inclinable to what is commonly called phyſicky. It has been reckoned an alexipharmic, and has been recommended by Caſper Hoffman as a divine remedy in the cholic and windy diſorders; but it is not now much in uſe with us.

IPECACUANHA is brought from America, and is of two kinds, the Peruvian and the Braſilian. The Peruvian is not a quarter of an inch thick, is crooked,

crooked, and as it were rough with circular rings; it is of a light brown or aſh colour, and is denſe, hard, brittle, reſinous, with a ſmall nerve which runs thro' its heart the whole length of the root; the taſte is ſubacrid, bitteriſh, and with little ſmell. The Braſilian Ipecacuanha is of a browniſh colour, and is crooked and rough, with rings like the former, but more rugged, and is little more than the twelfth of an inch in thickneſs; it is brown or blackiſh without, but white within, and of a ſlightly bitteriſh taſte. The *white Ipecacuanha* is a baſtard ſort, and is ſlender, woody, without wrinkles or bitterneſs. It is ſometimes imported by the merchants for the true *Ipecacuanha*, but may be readily diſtinguiſhed from it; for, beſides the marks already mentioned, it is of a whitiſh yellow colour, neither will it work upwards or downwards like the two former. Theſe laſt are now of great uſe in the beginning of dyſenteries and other fluxes of the belly; but the Peruvian is accounted the beſt. Eight ounces of the root will yield ten drachms of reſin, when the extract is made with ſpirits of wine. It has formerly been given to the quantity of a drachm; but now from ſix to ten grains are judged to be ſufficient. In a confirmed dyſentery, if the doſes are ſo ſmall as not to be ſtrong enough to purge, and given ſeveral times a day, it will cure the ulcers of the inteſtines. It is now more generally uſed as an emetic than for any other purpoſe.

IRIS FLORENTINA, *Florentine orris*, is a root which is brought to us in oblong pieces, and it is geniculated, a little flat, white, with a yellow reddiſh bark, which being taken off, the root has a bitter acrid taſte, with a fragrant violet ſmell. It is ſometimes twice as thick as a man's thumb. The *Iris noſtras purpurea*, the *common purple flower de luce*, is of the ſame kind as the former; for the roots, leaves and flowers, are of the ſame ſhape, though the colour is different. Florentine orris attenuates and incides the thick lympha lodged in the breaſt, and promotes its expectoration; whence it is good in the aſthma, ſhortneſs of breath, and coughs; but it is chiefly uſed as a perfume, and is often mixed with ſnuffs. The doſe is from a ſcruple to a drachm. When the juice is ſnuffed up the noſe, it brings away a great quantity of ſerum; and, mixed with bean meal, it is ſaid to take away freckles.

MECHOACANNA, *Mechoacan*, is a root brought from South America in white pieces, and is covered with a wrinkled bark. The ſubſtance is ſoftiſh with ſcarce any fibres, and the taſte is ſweetiſh, with a little acridity, which ſometimes cauſes a nauſea. It has rings ſomewhat like briony; but differs from it in being compact, and in having no bitter taſte, nor a ſtrong diſagreeable ſmell. It was looked upon at firſt as a moſt excellent purge, but is not ſo much cried up now ſince jalap became in uſe.

MEUM ATHAMANTICUM, *Spignel*, is an oblong root about as thick as the little finger and branched; it is covered with a bark of a ferruginous colour; but it is pale within, a little gummous, and contains a whitiſh pith. It ſmells almoſt like parſnips, though more aromatic, and the taſte is not diſagreeable, though it is acrid and a little bitter. It grows among the Alps and the Pyrenean mountains. It is ſaid to attenuate thick groſs humours, and is recommended in the humoral aſthma; but it is now but ſeldom uſed.

NARDUS-CELTICA, *Celtick-Nard*, is a fibrous, capillary, reddiſh root, covered with ſmall ſcales, of a yellowiſh green colour; with an acrid bitteriſh aromatic taſte, and a fragrant ſtrongiſh ſmell. It is ſaid to be a carminative, to ſtrengthen a weak ſtomach, and to help digeſtion; but it is now chiefly uſed in venice treacle and mithridate. The doſe is from half a drachm to two drachms.

NARDUS INDICA, *Indian Spikenard*, is a hairy root, or rather a congeries of ſlender capillaments adhering to a head, which is about as thick as the finger, and as long, and of the colour of ruſty iron; the taſte is bitter, acrid, aromatic; and the ſmell agreeable. It is ſaid to ſtrengthen the ſtomach, and to diſcuſs wind; but its principal uſe now is in venice treacle and mithridate.

NINZIN, and GINS-ING, are generally taken for the ſame roots, but they are diſtinct from each other; however, their outer appearance and virtues are much the ſame, though Gins-ing bears the much greater price. The root of Ninzin is in the ſhape of a parſnip, is three inches in length, and about as thick as the little finger, with a few fibres proceeding from it. It is pulpy, whitiſh, and has ſome faintiſh cracks on the outſide; but below it is divided into two branches. It has the ſmell of the yellow parſnip, and the taſte of ſkirrets; but it is not quite ſo ſweet, and there ſeems to be a little bitteriſh taſte. It grows in Korea, from whence it is brought to Japan, and is in high eſteem in thoſe parts; for they pretend it is endowed with extraordinary virtues. However, it is of no uſe with us. Gins-ing is a root of an inch long, and about as thick as the little finger; it is ſlightly wrinkled, and generally divided into two branches, but ſometimes into more, and at the ſmall ends there are ſlender fibres. It is a little reddiſh without, but yellowiſh within, and the taſte is ſubacrid, a little bitteriſh and aromatic, with an aromatic ſmell. On the top there are a row of knots placed in an irregular order, which ſeem to tell the years of its growth. It was thought only to grow in China and Tartary, between thirty-nine and forty-ſeven degrees of north latitude; but it is now found in Maryland and other parts near it, from whence it is brought to London, and ſent to the Eaſt Indies, where it bears a great price; for it is confidently affirmed, that in China they will give three pounds of ſilver for a pound of this root. It is looked upon by the inhabitants as a panacea, and is their laſt refuge in all kinds of diſorders.

PYRETHRUM, *Pellitory of Spain*, is about the length and thickneſs of a man's finger, and without it is of a blackiſh red, but it is white within, and has a moſt acrid burning taſte, though it is without ſmell. This is brought from the kingdom of Tunis; but there is another kind which is more ſlender, and not ſo acrid. This root is remarkable for opening the ſalival ducts, and for procuring plenty of ſpittle; hence it is by ſome looked upon as a ſpecific in the tooth-ach, from obſtructions and catarrhs. It is likewiſe good in ſleepy diſeaſes, and the palſy of the tongue, when chewed and held in the mouth. It is ſeldom or never given inwardly except in clyſters againſt ſleepy diſeaſes.

RHABARBARUM VERUM, *true Rhubarb*, is a root brought to us in thick unequal pieces, from four inches to five or ſix in length, and three or four thick. It is a little heavy, and of a duſky yellow on the outſide, but within it is of a ſaffron colour, and variegated with yellow in the ſame manner as a nutmeg; it is a little fungous, of a ſubacrid bitteriſh and ſomewhat aſtringent taſte, with an aromatic ſmell, but ſomewhat ſtrong. It grows in China, and though we have had ſeveral figures of the plant, it is not certain that any of them are like it, which is ſomewhat ſtrange, ſince it grows in all parts of that country, though principally near the great wall; it was formerly brought from China through Tartary to Aleppo, and from thence to Alexandria, and at length to Venice; but we have it now from the Eaſt Indies and Ruſſia. There is a ſort that was ſent to Juſſieu, and called *Rhubarb with an oblong curled undulated leaf*. It was ſaid to be the true China rhubarb, and is now growing in the phyſick garden at Paris; there is alſo ſome of it in the phyſick garden at Chelſea. It was brought to Mr. Rand, the then gardener,

gardener, and was called by him the Rhubarb, with an undulated ſmooth leaf, like burdock. Theſe were generally thought to be the right ſort; but Mr. Miller, the late gardener, affirms, that it was nothing elſe than the *Rhaponticum*. The faculties of Rhubarb are well known for both its purging quality, and for its general aſtriction of the ſtomach and inteſtines. It is ſuppoſed to open obſtructions of the liver, and it is excellent in looſeneſſes. It is ſo mild, that it may be given to all ages and ſexes at all times. However, it is not proper when the inteſtines are very hot, and there is a feveriſh heat. It is good in the jaundice, that proceeds from a clammy thick bile, which ſtops up the biliary ducts. Some chew it in a morning, before breakfaſt or dinner, to help digeſtion. It is given in ſubſtance from half a ſcruple to a drachm, and in infuſion to two drachms.

The true RHAPONTIC is the *Rhubarb of Dioſcorides*, and of the ancients, and is by ſome called the *Engliſh Rhubarb*. The impalement of the flower is compoſed of three ſmall leaves, which are turned back; and the flower itſelf has three leaves, which are larger than thoſe of the impalement, and are coloured. In the center of the flower is ſeated the three cornered pointal, ſupporting three ſmall ſtyles, and attended by ſix ſtamina; the pointal afterwards becomes a triangular ſeed, incloſed by the petals of the flower. It is frequently cultivated in gardens, and of late years the firſt ſtalks of the leaves have been uſed for making of tarts in the ſpring of the year; but they muſt have their outward ſkin peeled off, otherwiſe they will be very ſtringy: they have an agreeable acid flavour. When they are propagated for uſe, they ſhould be planted three feet aſunder, and in rich ground.

SARSAPARILLA root is made like a rod of ſeveral ells in length, whoſe twigs are of the thickneſs of a gooſe-quill, and are tough, flexible, and ſtreaked lengthways. The bark is thin, and the colour without is reddiſh, but aſh-coloured within; under this there is a white mealy ſubſtance, which is ſo ſoft, that it may be reduced to powder between the fingers; the taſte is bitteriſh and clammy, but not diſagreeable. Under this, in the middle, there is a woody bright tough ſubſtance, which is not eaſily broken. All theſe twigs or ſtrings proceed from a ſingle head as thick as a man's thumb, and ſcaly. It is brought from New Spain, Peru, and Braſil. It is ſudorific, and attenuates groſs humours. It has been reckoned a ſpecific againſt a well known diſeaſe, the gout, the palſy, and other chronic diſorders; but its virtues are now moſt approved againſt the firſt. The method of uſing it is this; to three ounces of the ſtrings, which are good and not ſpoiled with age or other accidents, three quarts of river-water muſt be added, and it muſt be made to boil as ſoon as poſſible, in an open veſſel, till two pints of the ſtrained liquor remain. This quantity is enough for twenty-four hours, and may be given at two or three times, either warm or cold. It muſt be made freſh every other day, and the patient's diet ſhould be ſlender while he takes it. Some have given it from half a drachm to two drachms in ſubſtance, and to half an ounce in decoction; but the former method is beſt. After all, it is not to be wholly depended on for the before-mentioned purpoſe, unleſs it receives the aſſiſtance of mercury, and that properly prepared by a very ſkilful hand.

SENEKA is the root of a plant called *Polygala Virginiana*, with oblong leaves and white flowers; but it is known to us by the name of the Rattle Snake root. It is uſually about the thickneſs of the little finger, and is variouſly bent or contorted; it is divided into many branches with lateral fibres, and has a prominent membranaceous margin, running lengthways; it is yelloviſh without, but white within, and has an acrid bitteriſh taſte, but ſomewhat aromatic. It is thought to be good in all other diſorders proceeding from a thick blood, particularly in the pleuriſy and inflammation of the lungs, firſt letting the patient blood. It has likewiſe been preſcribed in nervous diſorders, and ſlow fevers, with ſucceſs. The uſual doſe of the powder is about thirty grains. It will ſometimes vomit and purge; but if the patient cannot bear it, it may be prevented by mixing a teſtaceous powder with the tincture, or by giving twelve grains of ſalt of tartar in weak cinnamon water.

SERPENTARIA VIRGINIANA, *Virginian Snake-root*, is ſlender, fibrous, light, brown without, and yelloviſh within, with a ſubacrid bitteriſh taſte, and a fragrant aromatic ſmell, not unlike that of zedoary. It is now reckoned a ſpecies of the *Ariſtolochia*, and is brought from Virginia and Carolina. It conſiſts of a great number of ſtrings or fibres matted together, that proceed from a ſingle head. It is accounted a great alexipharmic, and is frequently given in malignant fevers, and epidemical diſeaſes. It may be given in ſubſtance from ten to thirty grains, and in infuſion to two drachms.

TURPETHUM, *Turbeth*, is a root, or rather the bark of a root, cut into oblong pieces about as thick as the finger, and is brown or aſh coloured without, but whitiſh within, with a ſubacrid nauſeous taſte. It is beſt when it is freſh, reſinous, not wrinkled, and eaſily broken. It belongs to an Indian Convolvulus. It has been thought a proper remedy to purge off thick and groſs humours from the remote parts of the body, and has been commended in cold chronic diſeaſes, eſpecially in the gout, palſy, and dropſy. The doſe is from fifteen grains to a drachm; but an extract made of ſpirits of wine is beſt, of which a ſcruple is a doſe: it is now not much in uſe.

ZEDOARY is a tuberoſe root that is denſe, ſolid, from three to ſix inches in length, and about as thick as a man's finger, terminating both ways in a blunt point. It is aſh coloured without, and white within, with an acrid, bitteriſh, aromatic taſte, and fragrant ſmell, which is moſt remarkable when it is chewed or pounded, and is ſomewhat like camphire. There is another ſort, called round Zedoary, that is in ſubſtance, weight, ſolidity, ſmell, and taſte, like the former; for it only differs in the ſhape, which is roundiſh, and only an inch in diameter. They are both brought from China; but the latter is ſeldom found in the ſhops. It has been greatly celebrated for its virtues: it promotes ſweat, incides groſs phlegm in the lungs, as well as in the ſtomach and inteſtines; it diſcuſſes wind, and cures the cholic proceeding from thence; it raiſes the ſpirits, and has been given in ſeveral chronic diſorders. The doſe in ſubſtance is from ſix grains to thirty, and two drachms will ſerve as an infuſion to be drank in the manner of tea.

ZERUMBETH is a tuberoſe geniculated root, with an unequal ſurface, and is from the thickneſs of a man's thumb to that of his arm; it is a little flattiſh, and of a whitiſh yellow colour, with an acrid taſte, not unlike ginger, and a fragrant ſmell: it is ſeldom or never kept in the ſhops.

ZINGIBER, *Ginger*, is a well known tuberoſe root, knotty, branched, and flattiſh, the ſubſtance is a little fibrous, of a pale or yelloviſh colour, and covered with a browniſh ſkin, which is commonly taken off before it is brought to us. The taſte is very acrid, hot, and aromatic, with a very fragrant ſmell. It is brought both from the Eaſt and Weſt Indies, where it is looked upon, while freſh, as an excellent remedy againſt the cholic, looſeneſſes of the belly, and windy diſorders. It ſtrengthens the ſtomach, helps digeſtion, and is ſaid to ſtrengthen the

the memory. It is often added to purges, to correct them; but it ſhould not be given in hot conſtitutions, for then it will do more harm than good. It may be taken in ſubſtance from five to fifteen grains, but it is oftener taken in infuſion or decoction from half a drachm to half an ounce. The doſe of that which is brought over candied, is from a drachm to an ounce.

NATURAL HISTORY of BARKS.

CINNAMOMUM, *Cinnamon*, is a well known ſpice, it being a bark that is ſometimes exceeding thin, and ſometimes pretty thick, and rolled up into a ſort of tubes or pipes of different lengths. The ſubſtance is leginous and fibrous, but brittle; the colour is of a yellowiſh red, with an acrid, pungent, pleaſant, agreeable taſte, and a moſt delightful ſmell. It is the ſecond and inward bark of a tree called *Canella Zeylanica*. It is commonly taken from trees that are three years old, in the ſpring or autumn; the aſh coloured outſide is taken off, and then it is cut into pieces, and expoſed to the ſun, and, when it is drying, it rolls itſelf up in the manner it is brought to us. When the tree is ſtripped of its bark, it continues naked for two or three years, and then another grows again, which ſerves for the ſame purpoſe. When it is diſtilled freſh, it yields plenty of oil, but when old and dry, very little; however, it is of two ſorts, one of which ſinks to the bottom of the water, and the other ſwims on the ſurface. This laſt is pale, but the former is of a reddiſh yellow colour, though they are both limpid, and of a moſt fragrant ſmell; but when they are taſted, they are exceedingly pungent. When the bark of the root is diſtilled, it yields an oil, with a volatile ſalt, or camphire, which is lighter than water, limpid, yellowiſh, and ſoon flies away. It has a ſtrong ſmell between camphire and cinnamon, and has a very pungent taſte. The camphire got from it is exceedingly white, and has a much finer ſmell than the common ſort, but it is extremely volatile, and takes fire immediately, whoſe flame leaves nothing behind it. The fruit of this tree is an oblong roundiſh berry, ſomewhat above a third of an inch long, and is ſmooth, green at firſt, but afterwards turns to a duſky blue, ſprinkled with whitiſh ſpecks. Under the green pulp there is a thin brittle ſhell, containing a roundiſh kernel. It is common in the iſland of Ceylon, where it is in as great plenty as hazel trees with us. Cinnamon is heating, drying, aperient, diſcutient, and alexipharmatic; it ſtrengthens the viſcera, recreates the ſpirits, helps digeſtion, and diſcuſſes wind. It is given in ſubſtance from a ſcruple to a drachm, and in infuſion from one drachm to two. The oil is ſo hot and burning, that it is never preſcribed alone; but it may be mixed with ſugar, and then given with any fluid. The doſe is from one drop to three. A ſingle drop on a lump of ſugar, is an excellent remedy againſt hiccoughing. Likewiſe, if a drop of it be put with cotton into a hollow tooth, it cures the tooth-ach by drying and burning the nerve. Cinnamon, though commonly uſed as a ſpice, ſhould be avoided when the ſtomach is inclinable to an inflammation, for then it does more harm than good; nor is it proper for hot and dry conſtitutions.

CASSIA LIGNEA, *Woody Caſſia*, is a bark brought to us in rolls like cinnamon, and has ſomewhat of the ſmell and taſte, but weaker, for which reaſon it may be eaſily diſtinguiſhed from it, beſides which it is clammy when taſted; however, the beſt is that which approaches neareſt to cinnamon. It has much the ſame virtues as cinnamon, though in a ſmaller degree; and when given as an aſtringent, it is preferred to it, on account of its glutinous quality; it is good in looſeneſſes, and to ſtrengthen the viſcera. The doſe in ſubſtance is two ſcruples, and, when infuſed in half a pint of white wine, an ounce.

CASSIA CARYOPHYLLATA is the bark of a tree called the *Clove-berry-tree*, and is found in the iſland of Cuba, and other parts of the Weſt Indies. It is as thin as cinnamon, and of a duſky yellow. It is brought in rolls like cinnamon, and has a taſte between cloves and that bark; but that of cloves is the moſt predominant. It grows ſtronger by length of time, and at length becomes ſo acrimonious, that the tongue is affected as though it was burnt with a ſlight cauſtic. It has the ſame virtues as cloves, but fainter.

CANELLA ALBA, by ſome called *Winter's-bark*, and by others *wild Cinnamon*, is rolled up in oblong tubes, in the ſame manner as cinnamon, but larger. It is thicker than cinnamon, and has an acrid, pungent, aromatic taſte, as if it had been mixed with cinnamon, ginger, and cloves. It is accounted a good remedy againſt the ſcurvy; it diſcuſſes wind, and is ſometimes uſed in diſorders proceeding from catarrhs. The doſe is from half a ſcruple to a drachm in ſubſtance, and to two drachms in infuſion.

CORTEX WINTERANUS VERUS, *true Winter's-bark*, is brought over in tubes like the former, and has a covering of an aſh colour, that is ſoft, fungous, unequal, and full of chinks; but within it is ſolid, denſe, and of the colour of ruſty iron, with an acrid, aromatic, pungent, burning taſte, but the ſmell is extremely fragrant. It was brought from the Straits of Magellan, by William Winter, in 1567. It has been accounted excellent againſt the ſcurvy, for which ſome reckon it a ſpecific. However, it is ſeldom or never to be met with in the ſhops, the Canella Alba being now uſed inſtead of it.

CORTEX PERUVIANUS, *Peruvian* or *Jeſuits bark*, is generally from the ſixth part of an inch to the fourth of an inch thick, and is rough on the outſide, it being of a browniſh colour; but ſometimes is covered with a hoary moſs: it is ſmooth within, a little reſinous, and of a reddiſh ruſty colour, with an intenſely bitteriſh taſte, and ſomewhat of aſtringency. Sometimes it is brought in large pieces, three or four inches in length or upwards, and an inch broad, and not rolled up, becauſe it is taken from the trunk of the tree; ſometimes inclining to tubes like cinnamon, though but ſlightly, and is marked with ſhallow circular chaps or fiſſures: this is taken from the ſlender branches. There is likewiſe a leſſer ſort, which is yellowiſh within, and hoary without, which is ſaid to be obtained from the roots, and is in high eſteem in Spain. It grows in South America, and particularly in Peru. It was at firſt greatly celebrated for its febrifuge qualities, and is ſtill in the higheſt eſteem upon that account. However, it has many other virtues, which have been diſcovered one after another; but that which was firſt remarked was its power in ſtopping mortifications. It is given, in various forms, for agues of every kind, and its tincture with ſaffron and ſnake-root is excellent in nervous as well as in ſpotted fevers. It is good in the meaſles, and cures the ſtrumous opthalmia and hectic fever, and has been found excellent in the epilepſy, as well as the hooping cough, and ſpitting of blood. It is of great uſe in a conſumption, and in the intermitting putrid fevers of that diſeaſe, as alſo in the hyſteric paſſion. It is good in the king's evil, cures a pimpled face, and malignant ulcers. It is excellent for hemorrhages in general, and for hyſteric convulſions. It is uſeful in tremblings, in languors, againſt the worms, as well as in a diabetes, and colliquative ſweats, in which laſt caſe it performs wonders: in ſhort, there is no ſingle remedy yet found out that is endowed with ſo

many excellent qualities. However, there is one not yet mentioned, which muſt not be forgotten, and that is its being an excellent preſervative in ſickly aguiſh countries, in all parts of the world, and in ſickly ſeaſons. The doſe of the bark in powder is half a drachm, though ſome have given it to two drachms; and if an ounce is infuſed in a pint of generous red wine, ſix ounces is a doſe; however, it is certain, that when it is given in ſubſtance, it is much more efficacious than either in infuſion or decoction; but when patients refuſe to take it in ſubſtance, the infuſion in wine is undoubtedly the beſt. In whatever form this medicine is given, it muſt always be repeated every third or fourth hour, and in agues muſt be repeated again in eight days time from the cure. It will be ſtill better to give it a ſecond or a third time, that is, a few doſes of it every eight days, and this proceſs is generally neceſſary for autumnal agues; beſides, it muſt be obſerved, that no evacuations of any kind muſt be made after taking the bark for ſome weeks, or even months after a cure is performed.

CORTEX ELUTHERIÆ is known abroad by the name of *Caſcarilla*, has been ſold for the Jeſuits bark, and it is ſtill called by ſome the grey Peruvian bark. It is rolled up in tubes of the thickneſs of the finger, and from two to four inches in length. It is thinner than the Peruvian bark, and is of a white aſh colour without, but within of the colour of ruſty iron, with a bitter aromatic taſte, and a fragrant ſmell when burnt. It is thought to be good in diſeaſes of the breaſt, particularly the pleuriſy and inflammation of the lungs, as alſo in looſeneſſes attending acute fevers. By its ſedative quality, it is uſeful in inflammations, though it is bad in the quinſy. It has produced good effects in internal hemorrhages, and in enormous vomiting, as well as in all fluxes of the belly. The doſe is from ſix grains to a ſcruple, though it has been given to a drachm three or four times a day.

Natural History of WOODS.

AGALLOCHUM, or LIGNUM ALOES, *Aloes Wood*, is of three kinds, and the firſt, which is beſt, is called Calambac by the Eaſt Indians. It is light, reſinous, and as ſoft as maſtick, for it will ſtick to the teeth and nails, and will melt over the fire with a very ſweet ſmell; but the taſte is bitteriſh and aromatic. The *Agallochum* of the ſhops is brought to us in fragments of various ſizes, which are heavy, denſe, and of a bay colour, variegated with blackiſh and reſinous ſtreaks: ſometimes there are holes in it, as if it was rotten; but they are filled with a ſort of reddiſh reſin, and then the colour of the wood is of a purpliſh black. The taſte of this is ſubacrid, bitter, and aromatic, and the ſmell is very agreeable. It grows in the iſland of Sumatra, in Cambaya, and more eſpecially in Cochin China. It is oftener met with in the ſhops than the former, becauſe the price of that is exceeding great.

AGALLOCHUM, or LIGNUM ALOES OF MEXICO, is more light, porous, and not ſo reſinous as that of the ſhops; the colour is of a browniſh green, and the ſmell is ſweet and fragrant, not unlike that of the true lignum aloes, but the taſte is bitter. It is not only met with in Mexico, but in the iſlands of Solor and Timor in the Eaſt Indies. It is ſeldom or never taken notice of as a medicine, but is uſed in making boxes, cheſts of drawers, and other things of that kind.

LIGNUM RHODIUM, *Rhodium Wood*, is a name given to woods of ſeveral kinds. It had its name from the iſland from whence it was brought, and was alſo called Cyprinum, becauſe it was had from the iſland of Cyprus. This wood is of a pale yellow at firſt, but in time grows reddiſh; it is thick, hard, and ſolid, and marked with fat reſinous knots, ſmelling like a roſe. There is another ſort of *Rhodium* brought from the iſland of Jamaica, and, though it ſmells like the true, it appears to be different on a careful examination.

GUAIACUM, otherwiſe called *Lignum Sanctum* and *Lignum Vitæ*, *the wood of Guaiac*, is ſolid, denſe, heavy, and reſinous, whoſe middle part or heart is of a blackiſh green, and variegated with pale green, and black colours; but the external part is of a paliſh yellow like box; it is of a bitteriſh and ſomewhat aromatic taſte, with a mild acrimony, and the ſmell, when burnt, is ſomewhat fragrant, and not diſagreeable. The bark is woody, thin, denſe, ſmooth, and ſomewhat reſinous, and conſiſts as it were of ſeveral thin plates laid one upon another; the outſide is of an aſh coloured green, or blackiſh, variegated more or leſs with green ſpots, intermixed with a livid or lead colour; it is pale within, of an acrid taſte, and diſagreeably bitter. It grows in the Weſt Indies, and particularly Mexico and New Spain: This wood is full of reſin, inſomuch that a pint of rectified ſpirit of wine will extract at leaſt two ounces thereof. When it is boiled in water for a conſiderable time, and afterwards gently evaporated, it will leave a maſs that looks ſomething like reſin, which is balſamic, of an agreeable ſmell, and a ſomewhat acrid taſte; when it is quite dry, reduced into powder, and taken as ſnuff, it will bring a large quantity of ſerum from the noſe; beſides which it is very friendly to the nervous parts of the head. *Guaiac* incides and attenuates groſs humours, opens obſtructions, promotes ſweat and urine, ſtrengthens the ſtomach, as well as all the reſt of the viſcera, cures inveterate obſtructions of the liver and ſpleen, and is prevalent againſt the jaundice, dropſy, and other diſorders thence ariſing. It is alſo good in the gout, rheumatiſm, and all ſorts of pains in the joints. It is a great friend to the nerves, brings all cold hard ſwellings to ſuppuration, and yet it is never attended with the leaſt bad conſequence. The bark has the ſame virtues as the wood. Twelve ounces of the wood, macerated in three quarts of water for a day, and then boiled over a gentle fire till half or more is evaporated, and ſtrained off, is called the cream of guaiac. We might here enlarge on its uſes in venereal caſes, and give the proper method of uſing it; but as this work is undoubtedly read by the young and inexperienced, ſuch directions might lead the unguarded part of them into experiments deſtructive of their health and conſtitutions, ſince the beſt medicines, when improperly applied, may tend to haſten death rather than a cure; and, as the learned know where to look for informations of this kind, they will readily excuſe an omiſſion, which properly does not belong to Natural Hiſtory.

LIGNUM TINCTILE CAMPECHENSE, *Logwood*, is well known as a dye, and is commonly brought from Campeachy in the Bay of Honduras. It is but lately uſed as a medicine, and that in looſeneſſes, in which it is very efficacious; for if two ounces of the chips are boiled in a quart of milk, and a quart of water to one quart, and a tea-cup full of this decoction be given every three hours, it ſeldom fails to cure a common diarrhœa.

LIGNUM NEPHRITICUM, *Nephritic wood*, is whitiſh or of a paliſh yellow colour, and is ſolid and heavy, with a ſubacrid and a little bitteriſh taſte; the bark is blackiſh, and the heart reddiſh or browniſh. The wood has been recommended againſt diſorders of the kidnies, and difficulty of urine.

SANTALUM RUBRUM, *red Sanders*, is a ſolid, denſe, heavy wood, brought over from the Eaſt Indies, ſometimes in ſtrait and ſometimes in crooked pieces.

pieces. It is the heart of the tree, and has no remarkable ſmell, but it has a ſlight aſtringent, and auſtere taſte. The virtues of theſe woods is not agreed upon by authors: however, they generally agree, that they are inciding, attenuating, aſtringent, and ſtrengthening. But the yellow is the moſt powerful incider, and is more aſtringent than the red.

SASSAFRAS is the root of a large American tree, and is brought to us in long ſtrait pieces, which are very light and of a ſpongy taſte. It is of a whitiſh red colour, and the bark is ſpongy, aſh coloured without, but within of the colour of ruſt of iron. The taſte of the wood is acrid, ſweetiſh, and aromatic, with a fragrant ſmell, not unlike that of fennel. Its virtues are ſudorific and inciding, and it is good in the cachexy, green ſickneſs, and dropſy. The oil of Saſſafras is good in diſorders of the breaſt, and particularly in coughs, pains, and ſpaſms. It may be taken alone or dropped upon ſugar, or a drop or two may be mixed with a powder good for the ſame purpoſes. It is a medicine not very commonly known, but exceedingly uſeful: *Saſſafras* is alſo made uſe of like tea.

NATURAL HISTORY of LEAVES and FLOWERS.

CORALLINA, *Sea moſs*, is a ſmall marine plant, divided into a great number of ſprigs, which are ſlender, brittle, and conſiſt of ſeveral joints. Without it ſeems to be covered with a ſort of a whitiſh ſtony ſubſtance, and the colour is various; for it is either white, reddiſh, yellowiſh, aſh coloured or black, and ſometimes of the colour of graſs. It has a nauſeous fiſhy ſmell, with a ſaltiſh diſagreeable taſte, and crackles between the teeth; it may readily be reduced to powder by rubbing it between the fingers. It is ſeldom above an inch and a half, or two inches long, and is found growing on rocks in the ſea, as well as on ſtones, ſhells, coral, and the like. It has no root, and is very plentiful on the ſhore of the Mediterranean ſea. That is eſteemed the beſt, which is whitiſh or aſh coloured. It is greatly cried up for its virtue in killing worms, and is given in powder from half a drachm to a drachm.

SCHOENANTHUS, *Camels Hay*, is brought in ſprigs with the leaves, and ſometimes with the flowers from Arabia; they are dry, ſtiff, round, ſhining, geniculated, and about a foot in length; it is full of a ſpongy pith, and is of a pale yellowiſh colour at the root, but near the top it is green or purpliſh; the taſte is hot, ſubacrid, bitteriſh, aromatic, and not diſagreeable. It is now out of uſe, except as an ingredient in venice treacle and mithridate.

MALABATHRUM, *the Indian leaf*, is like that of the cinnamon tree, and differs nothing from it except in ſmell and taſte. The tree, to which this leaf belongs, is called the white cinnamon tree of Malabar. It is now only made uſe of in venice treacle and mithridate.

SENNA, or SENA, conſiſts of ſmall dry, flattiſh, firm, and ſharp leaves of a yellowiſh green. The ſmell is not very ſtrong, but the taſte is ſubacrid, bitteriſh, and nauſeous. It is of two ſorts, the Alexandrine and that of Tripoly; which laſt is the worſt, and the leaves are green and large, with a blunt point and rough to the touch. This medicine is in great uſe as a purge, being ſeldom or never attended with the bad conſequences of draſtic purges. It is apt to gripe; for which reaſon phyſicians have endeavoured to correct it in various manners; ſome with ginger, others with cinnamon, and others again with ſpikenard. Some mix it with prunes, jujubs, raiſins, violets, marſh mallows, and polypody of the oak; others with things that diſcuſs wind, and incide groſs glutinous humours, ſuch as fennel-ſeeds, anniſeeds, coriander-ſeeds, and ſalt of tartar. Senna is not good in thoſe diſorders, in which the fluids are hot, and the ſolids tend to an inflammation, particularly in hemorrhages, all inflammations whatever, and diſeaſes of the breaſt. In an infuſion, or gentle decoction, it is preſcribed from a drachm to half an ounce, either alone or with other purging medicines. Some have endeavoured to correct its diſagreeable taſte by various additions, which however have not ſucceeded extremely well; particularly, they have recommended the greater water fig-wort for that purpoſe; but as it has a ſtrong ſmell, and a nauſeous bitter taſte, it can do little good this way; while others have recommended bohea tea with as little ſucceſs.

DICTAMNUM CRETICUM, or DICTAMNUS CRETICA, *Dittany of Crete*, is a leaf, of a roundiſh ſhape, about an inch long, and of a greeniſh colour, and covered with a thick white down. It is generally brought over with the ſtalks, from whoſe tops a ſort of ſpike of ſcaly leaves depend, of a purpliſh colour. The ſmell is fragrant and not diſagreeable, and the taſte is acrid, aromatic, and hot. The doſe in powder is from half a drachm to a drachm, and in infuſion from a drachm to half an ounce; but it is only uſed with us in venice treacle and mithridate.

THEA, *Tea*, is a ſmall dried curled leaf, with a taſte bitteriſh in a ſmall degree, and ſlightly aſtringent; the ſmell is very agreeable, and by ſome is likened to that of new hay, or violets. It is brought from China, and has variety of names; but it may principally be divided into three kinds, namely, the green, the imperial, and the bohea. The green is of ſeveral ſorts, and is of various degrees of goodneſs, from the common coarſe green tea to the hyſon, which is now the deareſt and accounted the beſt of all. The imperial tea is ſo called, becauſe it is chiefly uſed by the emperor and great men in China and Japan. The leaf is large, and not ſo much rolled up as in the other kinds: the colour is greeniſh, lively, and of a fine ſmell, with an agreeable taſte. This, not many years ago, was in great requeſt with us; but now we either have it not at all, or it is ſold under a different name. The bohea is of a reddiſh brown colour, and the leaf is ſmall, rolled up, and tinges the water of a browniſh colour; but the difference of taſte of theſe teas are ſo well known they need not be inſiſted on. Some authors aſſure us there is no difference between the green and bohea teas, but what ariſes from the manner of curing them; for the bohea is ſaid to be higher dried, or rather burned, from which it receives its different taſte and colour. The natives throw the bohea into a braſs veſſel full of water, and boil it over a ſlow fire, where they keep it the whole day, and it ſerves for their uſual drink; but theſe are the common ſort, for others are much more nice and careful in preparing it. The Japaneſe grind their tea into a ſmall powder, and then put a ſpoonful of it into one of their cups, pouring hot water thereon, and then they beat them together with a ſort of a bruſh compoſed of long briſtles, till a foam ariſes thereon; but the Chineſe make uſe of it in the ſame manner as we do. Tea is certainly of ſome uſe in abating the acrimony of the humours, and in keeping people awake, but more eſpecially in thoſe who drink it but ſeldom; however, when others take it late at night, it very often prevents their ſleeping ſound. It is gently aſtringent; for which reaſon it hinders the water from weakening the ſtomach, and in thoſe that take it but ſeldom it will prevent the operation of a purge. It has indeed ſome power in preventing the gravel, but then it does not ariſe from the tea, for hot water alone will do the ſame. In general it may be obſerved, that tea has different effects on different people,

people, and therefore, though it may be good for ſome, it is hurtful to others.

STOECHAS ARABICA, *French Lavender*, conſiſts of the florid tops of the plant, which, when dried, are called *Stoechas*; they are oblong, ſcaly, and of a purpliſh colour, with a ſubacrid bitteriſh taſte, and a fragrant pleaſant ſmell. Though it is called the Arabian Stoechas it is brought from the ſouthern parts of France, where it grows ſpontaneouſly. It is now cultivated with us by ſowing the ſeeds upon a bed of light dry ſoil in March. When the plants are come up they ſhould be carefully cleared from weeds, till they are two inches high, at which time they ſhould be removed into a light dry level ground prepared for that purpoſe, and ſet at about five or ſix inches diſtant from each other, obſerving to water and ſhade them well till they have taken root. It has a labiated flower, conſiſting of one leaf, whoſe upper lip is upright and cut into two; but the under lip, or beard, is cut into three parts; and both are ſo divided as at firſt to appear like a flower cut into five ſegments, out of whoſe flower cup riſes the pointal, attended by four embryoes, which afterwards become ſo many roundiſh ſeeds incloſed in the flower cup. The flowers are ranged in various rows with ſcaly heads, out of the top of which peep ſome ſmall leaves which look very beautifully. The Stoechas uſed in the ſhops is ſtill brought from the ſouth parts of France; but as it is apt to contract a mouldineſs in its paſſage, it is not near ſo good as that gathered freſh in England. It is recommended in cold diſorders of the head and nerves; however, it is rarely met with in preſcription, but is uſed in venice treacle and mithridate.

CROCUS, *Saffron*, grows in various parts of the world, but it is no where better, if ſo good, as in England. At preſent it grows plentifully in Cambridgeſhire, and in all that large tract of ground between Saffron-Walden and Cambridge. They begin to plough the ground in the beginning of April, and about five weeks after they lay between twenty and thirty loads of dung upon each acre of ground, but the ſhorteſt rotten dung is beſt; and this they plough into the ground. Soon after Midſummer they plough it again, and the time of planting is the latter end of July; the method of which is this: one man with a ſhovel raiſes between three and four inches of earth, and throws it before him about ſix inches; two women follow him with the heads of ſaffron, and place them in the fartheſt edges of the trench, which is made at three inches diſtance from each other. As ſoon as the digger has gone once the breadth of a ridge, he begins again at the other ſide, and digging before covers the root laſt ſet, and makes room for the ſetters to place a new row; and thus they go on till a whole ridge is planted. The quantity of roots planted in one acre is generally about a hundred and twenty-eight buſhels. When the leaves are ready to ſhow themſelves above ground, they pare the ground with a ſhort hoe, and take off the weeds. Some time afterwards the ſaffron flowers appear, which are gathered before, as well as after, they are full blown, and the moſt proper time is early in the morning. They carry them home in baſkets, ſpread them on a large table, and pick out the chives with a pretty large part of the ſtyle itſelf; but the reſt of the flower they throw away as uſeleſs. They then dry them on a kiln, which is built on a thick plank, ſupported by four ſhort legs, that it may be removed from place to place. It is ſet in the lighteſt part of the houſe, and they begin by laying five or ſix ſheets of white paper on a hair cloth, upon which they ſpread the wet ſaffron between two and three inches thick; this they cover with other ſheets of paper, and over all they lay a coarſe blanket five or ſix times doubled. At firſt they give the kiln a pretty ſtrong heat to make the chives ſweat. When it has been dried about an hour, they turn the papers and ſaffron upſide down, covering them as before. The ſame heat is continued for an hour longer, and then they take off the papers, cover the ſaffron as before, and lay on a weight. Then they have nothing more to do than to keep a gentle fire, and turn the cakes every half hour till thoroughly dried, which is generally performed in twenty-four hours.

Saffron has a flower conſiſting of one leaf, which is ſhaped like a lily, and fiſtulous underneath, the tube widening into ſix ſegments, and reſting on a foot ſtalk; the pointal riſes out of the bottom of the flower, and is divided into three headed and creſted capillaments; but the impalement afterwards turns to an oblong triangular fruit, divided into three cells, and is full of roundiſh ſeeds. It has a tuberoſe root, and long graſſy leaves, with a longitudinal white furrow thro' the middle of each. The parts of the flower uſed in medicine are the long ſtamina or chives, of a reddiſh flame colour. Saffron is endowed with great virtues, for it refreſhes the ſpirits, and is good againſt fainting fits and the palpitation of the heart; it ſtrengthens the ſtomach, helps digeſtion, cleanſes the lungs, and is good in coughs. It is ſaid to open obſtructions of the viſcera, and is good in hyſteric diſorders. However, the uſe of it ought to be moderate and ſeaſonable; for when the doſe is too large it produces a heavineſs of the head and a ſleepineſs; ſome have fallen into an immoderate convulſive laughter, which ended in death. A few grains of this is commonly a doſe, though ſome have preſcribed it from half a ſcruple to a ſcruple and a half.

NATURAL HISTORY of FRUITS and SEEDS.

DACTYLI, *Dates*, are oblong fruit of a roundiſh ſhape, of the thickneſs of a thumb and the length of a finger. They are in the form of acorns, and compoſed of a thin duſky yellow ſkin, with a fat, firm, ſweet pulp, and a thick, oblong, hard ſtone, furrowed longways. Thoſe are beſt that are large, ſoft, yellowiſh, with few or no wrinkles, and full of pulp. Dates are diſtinguiſhed according to their degrees of ripeneſs: the firſt is when the end begins to grow ripe, the ſecond when it is ripe to the middle, and the third when it is ripe in every part. With regard to the virtues of Dates, they are ſaid to ſtrengthen the ſtomach, ſtop looſeneſſes, and corroborate the inteſtines; they are alſo good in diſeaſes of the breaſt, and promote the expectoration of groſs humours. The tree that produces them grows in ſeveral parts of the world, particularly in Arabia, Syria, Perſia, Africa, as well as in Greece, Italy, and the ſouthern parts of France; but they do not thrive ſo well in theſe laſt places, and the fruit ſeldom comes to perfection.

SEBESTEN is a fruit not unlike ſmall plumbs, which are blackiſh, turbinated, pointed at the top, and wrinkled. They conſiſt of a duſky clammy pulp of a ſweetiſh taſte, which adheres firmly to the ſtone. It is in common uſe in ſome parts of Europe to abate the acrimony of the humours, and to appeaſe coughs proceeding from a ſoft phlegm, as well as in hoarſeneſſes and heat of urine. They are out of uſe with us, and conſequently are not kept in the ſhops.

UVÆ PASSÆ, *Raiſins*, are the ripe fruit of the vine dried in the heat of the ſun, and are univerſally known. There are ſeveral ſorts, though not all known to us, as the raiſins of Damaſcus, which are the largeſt; the raiſins of Provence, which are of a middle ſize; and the raiſins of Corinth, with us commonly called currants. Thoſe of Damaſcus are moſt in uſe with us, and are named raiſins of the ſun. There is alſo another ſort brought from Spain,

Spain, which are pretty much in uſe, called *Malaga* raiſins. The vine that produces the larger raiſins is like other vines, only the leaves are bigger, and not divided ſo much on the edges. The common uſe and taſte is known to every one, and as to their phyſical uſe, they are ſaid to attenuate groſs humours, and to abate their acrimony. Thoſe called jar raiſins, being ſtoned and eaten frequently, are excellent in obſtinate hoarſeneſſes. They are ſometimes uſed in decoctions, to abate the diſagreeable taſte of other medicines.

CARICÆ, *dried Figs*, are ſo well known that they need no deſcription. The flowers, which are always incloſed in the middle of the fruit, conſiſt of a ſingle leaf, and are male and female in the ſame fruit; the male flowers are ſeated towards the crown of the fruit, and the female, which grow nearer the ſtalk, are ſucceeded by ſmall hard ſeeds. The entire fruit is for the moſt part turbinated and globular, or of an oval ſhape, and is fleſhy, and of a ſweet taſte. Freſh figs, as well as thoſe which are dried, ſerve among other things for food in ſome diſtant countries; and when they are ripe, they are eaſy of digeſtion, and perhaps more ſo than any common fruit whatever. They are moderately nouriſhing, ſoften the belly, and are good in diſorders of the lungs, kidneys, and bladder; however, the too frequent uſe of them is hurtful, becauſe they generate wind. When they are dried they have the ſame qualities, but are better for medical purpoſes. They are ſometimes uſed in pectoral decoctions, and ſix figs are enough for every pint of liquor. Externally they are ſometimes applied in the form of a cataplaſm, to diſcuſs or ripen ſwellings. Some roaſt them, and apply them to ſwellings of the gums, and others to eaſe the pains of the piles.

MYROBALANI, *Myrobalans*, are of ſeveral ſorts; but the yellow are principally uſed in medicine, and are a dried fruit, of on oblong roundiſh turbinated ſhape, an inch and a quarter in length, and three quarters of an inch in breadth; they are blunt at both ends, and of a yellowiſh or citrine colour. They are marked generally with five larger ſtreaks, and as many that are ſmall between them; under the glutinous and as it were gummous bark, or rind, half a quarter of an inch thick, which is bitter, auſtere, and ſubacrid, there is a ſtone of a lighter colour, that is angular and oblong, with ſeveral pits or cavities; the kernel is whitiſh, and covered with an exceeding thin dark yellow membrane. The rind or pulp, for they are both together, is the only part in uſe. They proceed from a tree like that of wild plumbs, whoſe leaves are ſet by pairs, like thoſe of the aſh tree.

The CHEBULE MYROBALANS are the largeſt, and are oblong, angular, and ſaid to purge phlegm. They are like the former, but bigger, and more turbinated, and have likewiſe five high ribs made by the ſtreaks or furrows; but they are of a darker colour, and more inclinable to brown; within they are of a blackiſh red, but taſte as the former, though the pulp is thicker, and the kernel is fat, oblong, and of the ſame taſte. They grow on a tree not unlike a peach tree.

Indian, or black MYROBALANS, are leſs than the yellow, and are marked with nine oblong lines: they are rather wrinkled than ſtreaked, and are blunt at both ends. They are black on the outſide, and within are of a ſhining black, like pitch. The taſte is ſubacrid, bitteriſh, and a little acrid; they adhere to the teeth, and provoke ſpittle. The tree grows to the ſize of a wild plumb-tree, which has leaves like thoſe of willows.

The BELLIRIC MYROBALANS are a roundiſh fruit, of the colour and ſhape of a nutmeg, but a little more yellow, and almoſt an inch in length; the rind is bitter, auſtere, and aſtringent; under which lies a ſtone of a lighter colour, containing a kernel like that of a hazel nut.

EMBLIC MYROBALANS are a dried fruit, of a round ſhape, but marked with ſix angles, and of a blackiſh aſh colour. They are half an inch in diameter, and under the rind, which when ripe opens in ſix places, there is a white lightiſh ſtone of the ſize of a hazel nut divided into three cells. Generally ſpeaking, there is nothing but the dried ſegments of the pulp or rind brought over, which are of a blackiſh colour, and of a tartiſh auſtere taſte. They grow on a tree higher than any of the former, but we have no accurate deſcription thereof, nor indeed of any of the former. They have been looked upon to have a purgative faculty, without producing the leaſt weakneſſes, and by their aſtringency they ſtrengthen the bowels. The doſe is from an ounce to an ounce and a half, but the preſent practice has laid them aſide.

COLOCYNTHIS, *Coloquintida, or the bitter apple*, is about the ſize of an orange, of a roundiſh ſhape; the pulp when dried is ſpongy, and, as it were, full of cells; it conſiſts of ſmall membranaceous leaves, which are dry, white, and exceeding light when brought to us. It is of a very bitter, acrid, nauſeous taſte, and it has ſmall, flat, hard, white or reddiſh ſeeds, of the ſize of thoſe of a cucumber, but rounder and harder; it is brought from Aleppo.

It is now in uſe as a medicine, and is a moſt ſtrong violent purge; therefore only proper to be uſed in deſperate caſes, and in obſtinate inveterate diſeaſes. It has ſometimes very dangerous effects, for it greatly injures the ſtomach, viſcera, nerves, and even the whole body. It is often mixed with other purgatives, to render the operation more quick, and particularly with aloes and ſcammony. The doſe of it, when given alone, is from five grains to twenty, when reduced to a fine powder. It has ſuch a purging faculty, that when laid to the navel with oxes gall, it not only purges but kills worms.

CASSIA FISTULARIS, *the pudding pipe tree*, is an exotic fruit contained in ponds, ſometimes half a yard long, and about an inch in diameter; it conſiſts of a woody ſhell, of a dark brown colour, but though it is hard it is thin. It is divided into ſeveral cells with partitions tranſverſely placed, and parallel to each other; the pulp is ſoft, black, ſweetiſh, and of the conſiſtence of honey, containing oblong, roundiſh, flattiſh ſeeds, that are hard, ſhining, and of a duſky yellow. Thoſe pods are beſt that are freſh, full, and will not rattle when ſhaken. The pulp only is in uſe, which is taken from the pods, and is paſſed through a ſieve. It is looked upon as a mild, gentle, harmleſs purge, agreeing with all ſexes and ages. The tree from whence it proceeds, has been planted in the Weſt-Indies, but as it does not grow naturally there, it does not ſucceed very well; for it has a thicker ſhell, and the pulp is acrid and nauſeous. As a cathartic it muſt be given in a large doſe, but a ſmall one is ſufficient to keep the body open. Some have complained of its bad effects, and ſay it produces wind in the ſtomach and inteſtines; but by mixing it with cream of tartar, or boiling it with tamarinds, this may be prevented.

TAMARINDI, *Tamarinds*, are a fruit with a thick clammy pulp, brought to us in maſſes of a blackiſh colour, with an acrid taſte, and mixed with the rinds of the pods, as well as membranes, nerves, and filaments; as alſo with the hard ſeeds or ſtones. That pulp is beſt that is clammy, of a blackiſh red, acrid and moiſt. It is to be cleanſed from the membranes, filaments, and ſeeds, before it is uſed. It is brought from Egypt, and the Eaſt and Weſt-Indies.

The flower conſiſts of ſeveral leaves, which are ſo placed as to reſemble, in ſome ſenſe, one that

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is papilionaceous; but they expand circularly, and from the many leaved flower cup there ariſes a pointal, which afterwards becomes a flat pod, containing many flat angular ſeeds, ſurrounded with an acrid blackiſh pulp. The pods of the tamarind-tree in the Eaſt-Indies, contain ſix or ſeven ſeeds in each; whereas thoſe of the Weſt-Indies have ſeldom more than three or four. They may be propagated in England, by ſowing the ſeeds on a hot bed in the ſpring, and when the plants are come up, they ſhould each be ſet in a ſeparate ſmall pot, filled with light rich earth, and plunged into a hot bed of tanner's bark to bring them forward, obſerving to water and ſhade them till they have taken root. They muſt be conſtantly kept in the bark ſtove both winter and ſummer. When rightly managed, they will grow to the height of three feet in one ſummer from the ſeed. Tamarinds, beſides their purging quality, temperate the acrimony of the humours, abate the heat of the bile and blood, quench thirſt, and are good in acute burning fevers. They ſerve to correct the faults of violent purgatives, and to quicken thoſe that are ſluggiſh. The doſe is from one drachm to an ounce, and in decoction from one drachm to three ounces.

CARDEMOMUM, *Cardomum*, is of ſeveral kinds, of all which ſome account will be given. The ſeeds of the greater Cardomum are contained in a dried oblong fruit, about the ſize of a fig, and much of the ſame ſhape, with a broad circular navel at the top, divided in the middle into three parts, and including in a thin, membranaceous, tough, fibrous, wrinkled, brown or reddiſh colour, a great number of ſeeds in three cells, which are uneven, ſhining, reddiſh, and lodged in a ſort of membranes that lie between them.

The *middle-ſized* CARDOMUM *of Matthiolus, or the greater Cardomum of Bontius*, is an oblong fruit, of the length of an inch or an inch and a half, but ſlender, triangular, ſtreaked and blunt at the top; it is of an aſh colour, not eaſily broken, and divided into three cells that contain a great number of ſeeds, wrapped up in thin white membranes. It is oblong, angular, thin, and on one ſide divided by a ſort of ſmall pipe, and there are ſeveral tranſverſe lines run acroſs it. It is of a reddiſh white colour, with an acrid aromatic taſte. This ſort is very common.

The *leſſer* CARDOMUM *of Matthiolus* is the *Cardomum* of the ancient Greeks, and is a dried fruit with a ſhort membranaceous pod, not half an inch in length, of a triangular ſhape, but ſharpeſt at the pedicle, and blunt at the extremity; it is of a reddiſh colour, ſtreaked, and has a much thinner ſhell than the middle-ſized Cardomum. When it is fully ripe the three corners gape, and diſcover three cells, containing a double row of angular, wrinkled, reddiſh yellow ſeeds, but white within, and of an acrid, bitteriſh, aromatic taſte, ſomewhat like camphire. It is brought from the Eaſt-Indies. In the places where they all grow they are uſed as ſpices, and are ſaid to help digeſtion, to ſtrengthen the ſtomach and brain; and to promote urine. The doſe is from ten grains to a ſcruple in ſubſtance, and in decoction to half an ounce. They are much uſed in the preſent practice, that is the greater ſort, and are a very warm grateful ſpice.

AMOMUM VERUM, *the true Amomum*, brought from the Eaſt Indies, is a dried fruit growing in ſmall bunches, conſiſting of ten or twelve berries or membranaceous bladders, which are fibrous, and brittle, lying cloſe to each other without pedicles. The bunch is ſupported by a woody ſprig, which is fibrous, round, and the length of a man's thumb. It is adorned with leaves, as well as a row of ſmall ſcales, where there are no berries, and there are ſix long leaves ſurrounding each berry or grape like a flower cup. Three of the longeſt leaves are half an inch in length, but the other three are ſmaller, and ſcarce ſhew themſelves above the grapes. The thickneſs and ſhape of the berries are like that of a middle ſized grape; each contains three rows of ſeeds, ſeparated from each other by a thin membrane, and each row conſiſts of ſeveral angular ſeeds, wrapped up in the ſame thin membrane, and lying ſo cloſely together, that they appear to be only three long ſeeds. The whole bunches are of a wood colour, but paler in ſome than others. The ſeeds are ſolid but brittle, and the ſmell is fragrant, not much unlike that of lavender, but ſweeter; however, when they are taken out of their ſhells, the ſmell is more acrimonious, and they have an acrid taſte. They are ſaid to contain many virtues, but at preſent are only uſed in venice treacle.

CUBEBÆ, *Cubebs, of the ſhops*, are a fruit, or round dried grains like pepper, and ſometimes bigger, with a long ſlender pedicle, and a wrinkled, darkiſh aſh-coloured ſhell, containing a ſingle ſeed of a roundiſh ſhape, blackiſh without, and white within, with a ſweet, acrid, aromatic taſte, but not ſo hot as pepper. They are ſaid to be good in diſeaſes of the head, to create an appetite, to ſtrengthen the ſtomach, and to diſcuſs wind. The doſe is from three grains to a ſcruple, and infuſed in wine, from a drachm to two drachms.

PIPER, *Pepper*, is of ſeveral kinds, as *black pepper, white pepper, long pepper*, and *Jamaica pepper*.

PIPER NIGRUM, *black pepper*, is a dried fruit or grain, of the ſize of a ſmall pea, with a wrinkled, brown or black rind, which taken off, a hardiſh compact ſubſtance appears of a yelloviſh green colour, but white within; the taſte is acrid and hot, and ſeems, as it were, to bite the tongue. It grows on a ſhrub, with a ſmall, fibrous, tough, blackiſh root, which ſends out many ſhoots that are tough, flexible, green, and woody, which lie on the ground like hops, unleſs they are propped up; there are ſeveral knees, or knots, which when they lie upon the ground will ſend out ſhoots; and at each knot there are leaves alternately diſpoſed, and oppoſite to each other, that are roundiſh, two or three inches broad, and four long, terminating in points; the texture is thick and firm, and on the upper part they are of a ſhining duſky green; but beneath of a light green, and have ſhort, thick, green pedicles. The flowers grow in bunches, and are monopetalous, but divided into three parts at the edges, to which ſucceed the grains, which are ten, twenty, or thirty in number upon one pedicle, and are green at firſt, but red when ripe; but in drying they grow black and wrinkled. When the rind of black pepper is taken off, it becomes white, and is the only ſort brought to us by the name of white pepper. Black pepper is met with in Java, Sumatra, and on all the coaſts of Malabar.

Long PEPPER is an unripe dried fruit, about an inch or an inch and a half long. It is oblong, round, cylindraceous, and, as it were, ſtreaked with ſpiral lines, with tubercles placed in the form of a net; within it is divided into ſeveral ſmall cells, containing each a ſmall round ſeed, ſcarcely the twelfth of an inch in breadth, blackiſh without, but whitiſh within, with an acrid, hot, bitteriſh taſte.

Long pepper is commonly pickled, and is in high eſteem among ſome. It is very good in cold phlegmatic conſtitutions. They have all much the ſame virtues; for they heat, dry, attenuate, reſolve, open and ſtrengthen relaxed fibres of the viſcera; and by exciting an oſcillation therein, refreſh the ſpirits, divide groſs humours, and increaſe the circulation of the blood.

PIMENTA, *Jamaica pepper*, by ſome called allſpice, becauſe it has ſomewhat of the taſte of every one, is a dried unripe fruit, of a roundiſh ſhape, and gene-

generally ſomewhat larger than black pepper; the ſkin is brown and wrinkled, with a navel on the top, which is divided into four parts, and contains two black kernels covered with a greeniſh black membrane. The taſte is a little acrid, aromatic, and ſomewhat like that of cloves. It grows in ſeveral parts of the Weſt-Indies, is gathered while green, and dried in the ſun for many days; but they are taken in night and morning, to avoid the dew. It is uſed as a ſpice, ſtrengthens the ſtomach, helps digeſtion, and refreſhes the ſpirits.

CARYOPHYLLI AROMATICI, *Cloves*, are a dried unripe fruit, ſomewhat in the ſhape of a nail, and a little quadrangular, wrinkled, and of a blackiſh red. On the top there is a head, much about the bigneſs of a very ſmall pea, which is compoſed of ſcales wrapped one into another, and round about it there are four ſmall leaves, not unlike a flower cup, and diſpoſed like a ſtar, between which, in a cavity, there is a ſmall quadrangular ſtyle of the ſame colour. The taſte is acrid, bitteriſh, and agreeable, with a moſt fragrant ſmell. Cloves are the flower cups and embryoes of the fruit before the flowers are expanded, and are gathered from the month of October to February. When freſh, they are of a dark red, for they come blackiſh by being dried in the ſun and by ſmoke. They grow in ſeveral iſlands of the Eaſt-Indies, which are all now in the hands of the Dutch. Its principal uſe is as a ſpice, though it is ſaid to be good againſt all cold diſorders of the brain, ſwimming of the head, and weakneſs of ſight; it is alſo good for a cold ſtomach, and hyſterical diſorders. The doſe in ſubſtance, is from three grains to a ſcruple; but in infuſion, from thirty grains to two drachms.

ACAJOUS, or CAJOUS, by ſome called the occidental anacardium, and by the French the *nut of Acagous*, but by the Engliſh the *caſhew-nut*, is a fruit, or rather a nut, of the ſhape of a kidney, and of the ſize of a cheſnut; it is covered with an aſh-coloured, or brown ſkin, about a twelfth part of an inch thick, hard and tough; it ſeems to conſiſt of a double membrane with a fungous ſubſtance, which in its cells contains a ſort of oily fluid of the conſiſtence of honey; it is of a reddiſh colour, extremely acrid, bitter, and biting; for if a drop of it falls on the ſkin, it ſeems to burn it like a cauſtic; and if any one through ignorance ſhould bite the nut, the lips and tongue are immediately affected with a very ſharp pain. Under this is the kernel, which is covered with another brown ſkin of the thickneſs of paper, whoſe ſubſtance is extremely white, compact, oily, and of a more agreeable taſte than almonds. The tree that produces this nut is one of the beſt fruit trees in all America, ſome of which are of the ſize of ſtandard apricot-trees; and ſometimes are pretty regular, but generally the branches are crooked, knotty, and are ſtrangely contorted among each other. The wood is greyiſh, pretty ſtrong, tough, and heavy; the bark is thin, ſmooth, and of a dirty white, a little variegated with brown ſpecks and lines. The leaf is large, firm, well fed, pretty thick, and more round at the top than at the bottom. The flowers are ſmall and grow in tufts, and when they are opened they are divided into five leaves, which form a flower cup of ſmall ſtamina of a yellow golden colour, that ſurround a piſtil of the ſame colour but longer; the leaves that compoſe the flower are whitiſh at firſt, and afterwards turn to a purple mixed with white lines; but they are of ſmall duration, for the piſtil ſoon changes to a fruit. The tree, either ſpontaneouſly or cut, yields plenty of gum, that is reddiſh, tranſparent, and ſolid; it will diſſolve in water like gum-arabic, and ſupplies the place of glue; when the juice is expreſſed from the fruit and fermented, it becomes a ſort of heady wine, which greatly promotes urine, and the ſpirit diſtilled from it is very good. The thick fluid abovementioned tinges linen of a ruſty iron colour, which can hardly be got out. Some get an oil out of it, which will ſtain linen with a black colour that can never be got out, and if any wood be ſmeared with it, it preſerves it from rotting. The oily fluid firſt taken notice of is uſed for taking off warts and corns, when mixed with the black wax of Gaudaloupe, or warm water. The ladies make uſe of it to take off freckles, for it ſoon deſtroys the cuticle, which is ſucceeded by one that is fair and of a good colour. When the kernels are put into water, the ſkin will readily come off, and then they are fit to eat; but when they are dry, they open it a little with a knife, and then lay them over the fire, by which means the ſkin may be eaſily taken off. They are in very high eſteem among the inhabitants of the Weſt Indies, not only to eat by themſelves, but to make mackaroons and marchpains; beſides which, they give to roſa ſolis and other liquors a very fine flavour. They may be tranſported to any diſtant country, and will continue good for many years.

BEN, is the *Balanus Myrepſica of the ſhops*, and is a nut of the ſize of a hazel-nut, but of different ſhapes, for it is ſometimes oblong, roundiſh, or triangular; it is covered with a whitiſh ſhell, which is pretty thick and brittle, and contains a kernel covered with a fungous ſkin as white as ſnow, and of the ſame conſiſtence as an almond; it is fat and of a bitteriſh taſte. Eight pounds of the kernels will yield thirty ounces of a yellow limpid oil by expreſſion. This nut is of great uſe among the perfumers for extracting the fine ſmell out of flowers, becauſe it will never grow rancid, and has no ſmell of its own.

CACAO, or COCAO, the cholocate-nut, are oblong, roundiſh, and of the ſize of olives; and are covered with a thin, hard, brittle, blackiſh ſhell, which being taken off there remains a firm, denſe, dry, flattiſh kernel, of a duſky yellow on the outſide, and reddiſh, or of a bay colour within. They conſiſt of ſeveral pieces cloſely united together, and have a little bitteriſh and ſlightly acerb, but not a diſagreeable taſte. Some take notice of four ſorts of the trees, which grow ſpontaneouſly and without any cultivation, in many parts of America between the tropics; particularly near the river of the Amazons there are whole foreſts of them. The wild cocoa-tree is very large, and thick of branches; but thoſe that are planted are cultivated in ſuch a manner, that they never exceed twelve or fifteen feet in height, not only that the fruit may be gathered more eaſily, but that they may not be too much expoſed to the wind. The leaf is generally eight or nine inches long, and ſometimes more, but ſeldom leſs; and the breadth is one third of the length. It is pointed at both ends, and has a ſtrong ſtalk two or three inches long. It is of a lively green above, but deeper beneath, and the edges, from the place where it is broadeſt to the point, is of a very fine fleſh colour. The fibres or nerves are like thoſe of the cherry tree. This tree is an evergreen. It bears fruit twice a year, as well as moſt of the trees in theſe parts of America; but more properly ſpeaking, it is never without flowers or fruit; however, the produce is moſt plentiful near both the ſolſtices, but that near Chriſtmas is always the beſt. The flower is ſmall, and has ſix leaves when opened, which form a ſmall cup, in the center of which is a longiſh button, ſurrounded with five filaments and five ſtamina. The leaves of the flower are of a pale fleſh colour variegated with red ſpots and ſpecks; the filaments are of a reddiſh purple, and the ſtamina are of a fine ſilver colour; but the button is of a duller white, and it is this that produces the fruit. The flowers do not proceed from the branches, as in the European trees, but from the root up to

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one third part of the five large branches. The fruit that ſucceed theſe flowers reſemble cucumbers, and are pointed at the end; but on the ſides there are furrows like thoſe on melons, among which are ſmall unequal tubercles, and theſe contain the nuts before deſcribed; beſides which they contain a ſubſtance or pulp, of a paliſh colour, which is very light and delicate, and of the ſame taſte as pomegranates. Within this pulp are the nuts, of which there are twenty-five in number in each pod. The trees are in greateſt perfection when they are ten or twelve years old, not becauſe they bear more, but the largeſt fruit. The chief uſe of theſe nuts is for making chocolate, which is every where very well known, and is ſaid to have reſtorative qualities; for which reaſon it is good in conſumptions, prepared with milk, for then it abates the acrimony of the humours.

PISTACHIA, *Piſtachio nuts*, are of the ſize and ſhape of hazle-nuts, only they are a little angular, and higher on one ſide than the other. They are covered with a double ſhell, the outermoſt of which is membranaceous, dry, thin, brittle, and reddiſh when ripe; but the other is woody, brittle, ſmooth, and white, under which is a kernel of a pale greeniſh colour, and of an oily, bitteriſh, ſweetiſh taſte, and agreeable to the palate; it is covered with a red ſkin. It grows in Perſia, Arabia, Syria, and the Eaſt Indies; and is cultivated in Italy, Sicily, and the ſouthern parts of France. They yield good nouriſhment, and are ſaid to be reſtorative, cauſing thoſe that are fallen away to regain their fleſh very ſoon. They have been uſed to make emulſions in the ſame manner as almonds.

PINEI NUCLEI, *Pine-apple nuts*, are oblong, round, white, fat, ſweet, covered with a reddiſh coat, and are included in a thick hard ſhell. Theſe nuts are contained in the pine-apple, or cones, between their hard and woody ſcales. They contain a great deal of oil, which may be gained by expreſſion; and are ſaid to be very nouriſhing, but they are not eaſily digeſted. Some account them good for conſumptive patients, becauſe they deſtroy the acrimony of the humours; they are alſo good in heat of urine, and in ulcers of the kidnies and bladder.

COFFEE is a hard ſeed in an oval form, and ſomewhat above a third of an inch long, and a quarter of an inch broad; one ſide is convex and the other flat, marked with a remarkable furrow. It is yellowiſh or of an aſh coloured paliſh green, it has a farinaceous taſte, and before it is roaſted has not much ſmell. The cup of the flower conſiſts of one leaf, which is divided at the top into five ſegments, and the flower likewiſe conſiſts of one leaf in the ſhape of a funnel, and divided into five ſegments; the flowers are ſucceeded by berries, which ſplit in the middle. The coffee-tree is propagated by ſeeds, which ſhould be ſown ſoon after they are gathered, otherwiſe they will not grow, which is the reaſon that all other countries, except Arabia, have been ſo long without it. It was neceſſary to get trees that were growing, which has been at length done, and there are now many of them as well in Europe as in America; but they ſucceed beſt in the Caribbee iſlands; however, the coffee is not accounted ſo good as the Arabian. The berries are commonly ripe with us in April, at which time they ſhould be ſown in pots of freſh light earth, covering them about half an inch thick with the ſame; and then the pots ſhould be plunged into a moderate hot bed of tanner's bark, obſerving to refreſh them often with water; as alſo to raiſe the glaſſes in the heat of the day to admit freſh air; and in very hot weather it will be proper to ſhade the glaſſes with mats.

The bloſſoms, or flowers are white, and ſhoot out juſt where the ſtalks of the leaves join the branches; when the bloſſoms fall off there remains a ſmall fruit, which is green at firſt, but as it ripens becomes as red as a cherry, and not unlike one; and it is very good to eat, being ſtrengthening and refreſhing; under the fleſh of the fruit, inſtead of a ſtone, there is the berry, covered with a fine thin ſkin. When the fruit has been dried by the ſun, the pulp becomes a ſhell of a deep brown colour, under which there is a thick brown liquor extremely bitter. Some direct the taking off the pulp of the berries before they are ſowed, but this is a miſtake; for they will come up ſooner when it is left on, and produce ſtronger plants. There are two ſeeds in each berry, which ſeldom fail to grow; but, when the plants are young, they may be eaſily parted and ſet in different pots, and about an inch and a half high. In the winter ſeaſon they ſhould be placed in a bark ſtove, and kept up to the heat proper for pine-apples. In Arabia they bear ripe fruit twice or thrice in a year. The uſe of coffee is now well known every where, and the liquor made with it is generally ſuppoſed to be good in weakneſſes of the ſtomach, in want of appetite, and in the flatulent cholic. It prevents ſleepineſs, and is good in ſleepy diſeaſes, for which reaſon it refreſhes the brain and the animal ſpirits. It is good for thoſe that are fat, and abound with thick groſs humours; but with thoſe that are lean, and have hot conſtitutions, it does not ſo well agree, nor yet with thoſe of melancholy diſpoſitions.

NUX MOSCHATA, or NUX MYRISTICA, the *Nutmeg*, is very firm and compact, and yet is very eaſily pounded in a mortar. It is wrinkled without, and ſomewhat of an aſh colour; but within it is variegated with a whitiſh yellow, and a bay colour, running in veins without any regularity. The trees that bear nutmegs are now entirely in the poſſeſſion of the Dutch, as are all the ſpice iſlands; they are like pear trees, and have an aſh coloured bark, with a ſpongy wood. The flowers, or bloſſoms, are yellowiſh, with five leaves, not unlike thoſe of cherries; to theſe ſucceed the fruit, hanging to a long pedicle. It is ſomewhat like a walnut, and the kernel, or nutmeg, is covered with three coats, the firſt of which is fleſhy, ſoft and juicy, about as thick as a man's finger, but villous and red, and variegated with yellow, gold colour, and purple ſpots, like a peach. When it is ripe it gapes ſpontaneouſly, and is of an auſtere taſte. Under this there is another reticular covering, or rather divided into ſeveral parts, which is of an oily clammy conſiſtence, and as it were cartilaginous, but thin, of an agreeable aromatic ſmell, and of an acrid aromatic taſte, with a ſort of bitterneſs. It is of a ſaffron colour, and is what we call MACE. Between the clefts of this there is a third covering, which is a hard, woody, thin ſhell, of a duſky reddiſh colour, and brittle, and in this the nutmeg is contained. It is ſoft at firſt, but grows dry and hard in time. The taſte and ſmell is too well known to need a deſcription. The principal uſe of nutmegs is as a ſpice, and they are good to promote digeſtion, to ſtop vomiting, to diſcuſs wind, and to eaſe pains of the cholic. However, the immoderate uſe is bad, for it will affect the head, and produce ſleepy diſeaſes, as they have found by experience in the Eaſt Indies. When toaſted they have a binding quality, and are good in fluxes of the belly, and are given to the quantity of a drachm.

NUX VOMICA, *the Vomit nut*, is round, flat, depreſſed, about an inch broad, and a quarter of an inch thick; it is of a hard horny ſubſtance, of an aſh colour, and a little downy without, with a navel on the middle of each ſide; but one ſide is flatter than the other, and the taſte is bitter; it is brought from the Eaſt Indies with ſnake-wood. It is of no uſe in medicine.

CARTHAMUS, *Baſtard Saffron*, produces ſeeds that

that are ſometimes uſed in medicine, but the flowers very ſeldom, for they are chiefly uſed as a dye. It agrees with thiſtles in moſt of its characters, only the ſeeds are always without down. It is greatly cultivated in Germany, and is brought into England from thence, for the uſe of the dyers. It is ſown in the open fields in the ſpring of the year, and when come up they hoe it out thin, as we do turnips, leaving the plants about eight or ten inches diſtant every way. Theſe plants divide into a great many branches, each of which bears a flower at the top of the ſhoot, which when fully blown they pull off, and is the part the dyers make uſe of.

SANTONICUM SEMEN, *Worm ſeed*, is a groſs powder, conſiſting of oblong, ſcaly, yellowiſh, green grains, of a diſagreeable bitter taſte, with ſomewhat of an aromatic acrimony; the ſmell is a little aromatic, but nauſeous, and there ſeem to be diminutive leaves and exceeding ſmall ſtreaked ſtalks among it. Its chief virtue is againſt worms, beſides which it is ſaid to ſtrengthen the ſtomach, diſcuſs wind, and excite an appetite; the doſe is from a ſcruple to a drachm.

ANISUM INDICUM STELLATUM is a fruit in the form of a ſtar, which conſiſts of ſix, ſeven, or more capſulæ, meeting like rays in the center; it is of a triangular ſhape, and from near half an inch to an inch in length, and from a quarter to near half an inch broad. It is a little flat and united at the baſe, being compoſed of a double rind, the outermoſt of which is hard, rough, wrinkled, and of a bay or ruſty colour; but the inſide is hard, ſmooth, and ſhining, and has two valves, which gape on the upper part in thoſe that are dry and old. There is in every one a kernel, which is ſmooth, ſhining, oblong, flat, and near a quarter of an inch long, and a twelfth broad, of the colour of linſeed, which in a ſlender brittle ſhell contains a whitiſh, fat, ſweet fleſh, or pulp, agreeable to the palate, and of a taſte between aniſeed and fennel-ſeed, but ſtronger. The capſula has the taſte of fennel mixed with ſomewhat of an acidity, and the ſmell is like it, but more fragrant. It is brought from China, Tartary, and the Philippine iſlands, and has the ſame virtues as aniſeeds and fennel-ſeeds, but ſtronger. They ſtrengthen the ſtomach, diſcuſs wind, and promote urine.

NATURAL HISTORY of LIQUID RESINS.

THE fluids that flow ſpontaneouſly from any plant or tree, or from the wounded bark, either concrete into a reſin, or gum, or are ſomewhat of a middle nature between a gum and a reſin, which ought carefully to be diſtinguiſhed from each other.

A reſin is a fat, oleaginous, inflammable ſubſtance, that will not diſſolve in water, but will in oil or ſpirit of wine. It is of two ſorts, for one is clammy, liquid, and tenacious; and the other dry and brittle, which however will grow ſoft with heat.

A gum is a concreted juice that readily diſſolves in water, but will neither melt nor take fire. A gum reſin is that which will diſſolve equally in water or oil, or at leaſt for the greateſt part, and is compoſed of reſinous and gummous particles.

OPOBALSAMUM, *Balm of Gilead*, is a liquid reſin, of a very light yellowiſh colour, and of a fragrant ſmell, not unlike that of citrons, but the taſte is acrid and aromatic. Authors have long diſputed where this balſam is produced; but it is certain, that it is now only to be met with in Arabia Felix, and has different virtues according to its age, for when freſh it has a much greater efficacy than when old. It is given inwardly againſt putrefaction of the viſcera, and abſceſſes of the lungs, liver, and kidnies. The doſe is from two ſcruples to a drachm. It alſo cleanſes foul ulcers, and heals them in a ſhort time; but it is hard to be met with genuine, and very little that is ſo is brought over to us.

BALSAMUM PERUVIANUM, of which there are two or three ſorts, as the *Balſamum Peruvianum album*, *the white Balſam of Peru*, that is fluid, and thinner than turpentine, but of a clammy conſiſtence, and is reſinous, inflammable, limpid, and of a yellowiſh white colour. The taſte is a little acrid and bitteriſh, but the ſmell is ſweet and fragrant, approaching to that of ſtorax. It is brought from Spaniſh America.

BALSAMUM PERUVIANUM FUSCUM, *brown Balſam of Peru*, is fluid, reſinous, clammy, and nearly of the conſiſtence of turpentine; the colour is brown or of a reddiſh black, with a moſt fragrant ſmell like that of benjamin; but the taſte is ſubacrid, and a little pungent on the tongue. It will readily take fire and flame, the ſmoke of which ſmells extremely agreeable. That which is quite black is bad. They both are the juice of the ſame tree, and the one proceeds from the wounded bark of the tree; but the other is obtained by boiling. They cut the wood, bark, and branches, into very ſmall bits, and then boil them in water for a conſiderable time; when the water is cold, the balſam will ſwim on the top, which they put in ſhells, and keep for uſe. The doſe is from four drops to twelve in an aſthma, conſumption of the lungs, and fits of the gravel. Outwardly they eaſe pains proceeding from cold humours, and are excellent in healing wounds.

BALSAMUM TOLUTATUM, *Balſam of Tolu*, is a reſinous clammy juice, of a middle conſiſtence between a fluid and a ſolid; the colour is bay, inclining to that of gold; it has a moſt fragrant ſmell, and the taſte is ſweet and agreeable, for it does not create a nauſea like other balſams. It is brought in ſmall gourd ſhells from South America, and particularly from Tolu. In length of time it becomes dry, hard, and brittle. It has the ſame virtues as balſam of Peru, and is of great uſe in conſumptions of the lungs, and internal ulcers. It is very efficacious in curing wounds, and ſerves to make what is called the ladies black ſticking plaſter now ſo much in vogue.

BALSAMUM COPAIBA, *Balſam of Capivi*, is a reſinous liquid juice, and while freſh is of the conſiſtence of oil, but in time it grows thick and glutinous. It is of a yellowiſh white colour, with an acrid, bitter, aromatic taſte, and of a fragrant ſmell. It is brought by the Portugueſe from Braſil into Europe. It is often adulterated with turpentine, but may readily be known from it when taken; for it does not give the violet ſmell to urine as that does. It abates the acrimony of the humours, enriches poor blood, and it both inwardly and outwardly heals all manner of wounds. It is alſo good in diſorders of the lungs, and is excellent in appeaſing coughs. It is given in a bolus with ſugar and powder of liquorice, from five to twenty drops.

LIQUIDUM AMBARUM, *liquid Amber*, is a reſinous, liquid, fat juice, of the conſiſtence of turpentine, and of a yellowiſh red colour; it is of an acrid aromatic taſte, with a fragrant ſmell, not unlike ſtorax. It is brought from New Spain, Virginia, and other parts of America. It was formerly of great uſe among perfumers, but is now laid aſide, and is ſeldom met with in the ſhops.

STYRAX LIQUIDUS, *liquid Storax* is a reſinous juice, of which there are two ſorts in the ſhops, the one pure, and the other impure or thick. The beſt is of the conſiſtence of turpentine, and ſemi-tranſparent; the colour is brown, or of a reddiſh brown, and ſometimes of an aſh coloured brown, with a ſtrong ſmell like ſtorax; but it being ſo violent it is diſagreeable, and the taſte is a little acrid, aromatic,

and oleous. The impure ſtorax is a reſinous juice, full of dregs, and of a browniſh or aſh colour; it is alſo opaque, fat, and has not ſo ſtrong a ſmell. It is the produce of a particular tree, growing near Suez in Arabia, whoſe bark they ſtrip off every year and boil in ſea water to the conſiſtence of bird-lime, and then they take off the reſinous ſubſtance ſwimming at the top. It is in like eſteem among the eaſtern people; it is ſaid to have the ſame virtues as the former balſams, and is given from three drops to twelve to heal internal ulcers; but it is more commonly uſed outwardly for wounds, bruiſes, and ulcers.

TEREBENTHINA, *Turpentine*, is of ſeveral kinds, and there are four kept in the ſhops.

TEREBENTHINA CHIA VEL CYPRIA, *Chio Turpentine*, is a reſinous liquid juice, of a whitiſh yellow colour, inclining a little to blue; it is ſometimes tranſparent, and ſometimes of a pretty firm conſiſtence, and ſometimes ſoft, thick, and glutinous. The taſte is a little bitteriſh and acrid, and the ſmell is alſo acrid but not diſagreeable. The beſt is brought from the iſlands of Chio and Cyprus. The uſe of this, as well as of the other turpentines, is both external and internal; externally it is emollient, diſcutient, reſolvent, cleanſes ulcers, and heals recent wounds. But it is generally preſcribed inwardly, and is remarkable for healing ulcers of the ſtomach, inteſtines, liver, kidnies and bladder. It is good in an old cough, for purulent ſpitting, and the beginning of a conſumption. It promotes urine, gives it a violet ſmell, and is good in heat of urine. The common doſe is from half a drachm to a drachm and a half, in the form of a bolus, or diſſolved in the yolk of an egg.

TEREBENTHINA VENETA, *Venice Turpentine*, is a reſinous, liquid, limpid, clammy ſubſtance, thicker than oil, but more liquid than honey; it is a little tranſparent like glaſs, and of a yellowiſh colour; the ſmell is reſinous, fragrant, and acrid, but not diſagreeable: the taſte is acrid and bitteriſh. It is called Venice turpentine, becauſe it was formerly brought from Venice; but now from Savoy, and the ſouthern parts of France.

TEREBENTHINA ARGENTORATENSIS, *Straſburg Turpentine*, while freſh is more liquid than the former, and is more tranſparent, not ſo clammy, and has a finer ſmell, ſomething reſembling that of citrons; but the taſte is more bitter, pretty much reſembling that of citron peel; in time it grows yellowiſh and thick. It flows from the tree called abies taxifolio, that is, the fir with the leaf of the yew tree; not only from its trunk and boughs, but alſo from certain tubercles within the bark. That which proceeds from the trunk is the worſt, and when dry it reſembles frankincenſe in colour and ſmell, but that which proceeds from the inciſion of the tubercles is beſt. It has the ſame virtues as Venice turpentine, though ſome think it is more efficacious, and it is given in the ſame manner.

TEREBENTHINA COMMUNIS, *common Turpentine*, is more thick and tenacious than any of the former, and is not ſo tranſparent; it has a reſinous ſtrong ſmell, with an acrid, bitteriſh, nauſeous taſte. It proceeds from the pine-tree, either ſpontaneouſly or from inciſions. The white reſin, called by the French galipot, is commonly mixed with wax for the making of flambeaux. When the white reſin is melted with common turpentine, and oil of turpentine, the compoſition is called Burgundy pitch. In ſome places, the trunks of the old pine-trees that are ſtill ſtanding, have a ditch made round them and ſet on fire, which forces out a fluid well known by the name of tar, of which tar-water is made, lately ſo much in vogue, for the curing almoſt all ſorts of diſtempers. All ſorts of reſins being ſet on fire, produce ſoot, which preſerved, is known by the name of lamp black. All ſorts of reſins, as well liquid as ſolid, are emollient; digeſtive, reſolvent, and ſerve to make plaſters and ointments for the curing of wounds and ulcers.

Natural History of SOLID RESINS.

ANIME *vel* ANIMUM, *Gum Anime*, is improperly called a gum, for it is nothing but a reſin, and is either oriental, or occidental. It is a tranſparent reſin, and is brought in fragments of various colours, for ſome are white, others reddiſh, and others brown. When kindled, it has a pleaſant ſmell, and is brought from Arabia to us. We know nothing of the tree that it proceeds from, nor are we certain that this is its proper name.

AMINE OCCIDENTALIS SEU AMERICANA, *American Anime*, is a white reſin, a little inclining to the colour of frankincenſe. It is more tranſparent than copal, but more oleaginous. It is of a moſt grateful and ſweet ſmell, and when thrown upon live coals ſoon burns away. It is brought from New Spain, Braſil, and the American iſlands. Some apply this outwardly, when diſſolved in oil or ſpirits of wine, to ſtrengthen the nerves.

BENZOINUM, *Benjamin*, is a dry, hard, brittle, inflammable reſin, conſiſting of various bits, ſome of which are yellowiſh, others whitiſh, in the ſame maſs; it has a reſinous taſte, with a ſweet fragrant ſmell, eſpecially when it is ſet on fire. There are two ſorts, one of which is pale, or of a reddiſh yellow, containing white grains like almonds; the other is blackiſh, with few or no ſpots. It is brought from the kingdom of Siam, and the iſlands of Java and Sumatra; that of the lighteſt colour is beſt. Its principal uſe is as a perfume, though it is good in diſorders of the breaſt, promotes expectoration, and appeaſes coughs. The flowers of *Benjamin* promote ſweat, and are good in the aſthma. The reſin is uſed externally to ſtrengthen the head, ſtomach, and nervous parts, when made up into a plaſter; the tincture is of great uſe in taking off tubercles and redneſs of the face.

CAMPHORA, *Camphire*, is a reſinous fattiſh ſubſtance, white, light, and tranſparent, and is brought to us in a ſort of loaves or maſſes, ſix inches long and one or two thick; it has an acrid, bitteriſh, aromatic taſte, and yet with a ſenſe of coldneſs: the ſmell is fragrant, ſomewhat like roſemary, but much ſtronger. It is ſo volatile, that when expoſed to the air it will diminiſh by degrees, and at length fly quite away. It eaſily takes fire, leaving no earth, or any thing elſe behind it, when it has done flaming. It is brought from Japan into Holland, and from thence diſperſed all over Europe. In the Eaſt Indies it is diſtinguiſhed into two ſorts, namely, that which is brought from Japan or China, and that which is produced in the iſlands of Borneo and Sumatra; but this is very dear and uncommon, and is ſeldom or never brought to us. It is produced from a tree like a laurel, but of a very large ſize, for it grows to the bigneſs of an oak tree. Camphire may be got from any part of it, for it flows through inciſions like other reſins, but in ſome places the country people cut the root and wood into ſmall bits, pouring water upon them, and boiling them in an iron veſſel, with a head fixed thereto made of ſtraw, to which when it is ſublimed it ſticks like ſoot. However, it is coarſe when firſt brought over to Europe, and is cleanſed by the Dutch. The virtues of camphire are very great, eſpecially in the hands of a ſkilful phyſician: for it is an alexipharmic, and is both anodyne and diaphoretic, without heating the body or diſturbing the circulation of the blood; neither does it occaſion thirſt, nor render the urine of a higher colour, as hot medicines will. It

has alſo an anodyne and ſoporiferous quality, and is good in pains, madneſs, and ſpaſms, often producing wonders. The doſe is from three grains to a ſcruple, given in the form of a bolus, or diſſolved in oil of ſweet almonds. It is uſed externally, when diſſolved in ſpirits of wine, in rheumatic pains and inflammations; it is alſo good againſt burns and ſcalds.

CARANNA, *Caranna*, is a reſinous ſubſtance; as ductile as pitch when it is freſh, but when old it is hard and brittle, of a blackiſh aſh colour without, and brown within; it has a reſinous bitteriſh taſte, ſomewhat like myrrh, and when kindled has a fragrant ſmell. It is brought from America in maſſes wrapped up in a ſort of leaves. It is only of outward uſe, and is ſaid to reſolve tumours, eaſe pains, and ſtrengthen the nerves. It is made into a plaſter and laid to the temples for the tooth-ach, and on the top of the head for the head-ach.

ELEMI, *Gum Elemi*, is a yellowiſh reſin, or of a greeniſh white, pretty hard on the outſide, but within ſoft and clammy, and is brought to us in maſſes of a cylindrick form; when ſet on fire it has a ſtrong but not diſagreeable ſmell, ſomewhat like fennel. This is the *true elemi* that was brought from Ethiopia, and is now ſeldom to be met with in the ſhops.

ELEMI AMERICANUM, *American Elemi*, is ſometimes whitiſh, ſometimes yellowiſh, and ſometimes greeniſh. It is ſomewhat tranſparent like reſin, and has a ſtrong ſmell like that; this is very common in the ſhops, and is only uſed outwardly for reſolving tumours, diſſolving ulcers, and eaſing pains. It is particularly recommended againſt diſeaſes of the head and tendons, eſpecially the ointment prepared with it, which is called the balſam of Arcæus.

RESINA HEDERÆ, the gum of the ivy tree, is a reſinous, dry, hard, compact, brown or ruſty coloured ſubſtance, ſomewhat tranſparent; it is broken into ſmall fragments, among which ſome are of a reddiſh colour; the taſte is ſubacrid, a little aſtringent and aromatic, but it has no ſmell. It is brought from Perſia, and other oriental countries.

LADANUM or LABDANUM, *Labdanum*, is a reſinous ſubſtance, of which two kinds are met with in the ſhops, one of which is brought in large compact maſſes, and is of an agreeable ſmell, with a reddiſh black colour. It is wrapped up in bladders or ſkins; but the other ſort is without any, and is of a contorted ſhape, ſomewhat like a ſcrew, and is dry and brittle; but when heated by the fire is a little ſoft, and is mixed with a kind of black ſand. It is of a black colour, and weaker than the former, but is moſt commonly met with amongſt us. Outwardly, labdanum is emollient, and is uſed to ſtrengthen the ſtomach and promote digeſtion; but it is very ſeldom uſed.

MASTICHE, *Maſtich*, is a dry reſin, of a pale yellowiſh colour and tranſparent; it is brought in tears of the ſize of ſmall peas, and is brittle at firſt between the teeth, but when warm it ſticks thereto; and when thrown upon live coals it takes fire, emits a pretty good ſmell, and the taſte is ſlightly aromatic, reſinous, and ſubaſtringent. That is beſt that is pale, yellowiſh, tranſparent, dry, brittle, and has a pretty ſtrong ſmell; but the black, green, livid, or impure, is good for nothing. Some phyſicians have commended maſtich for ſtrengthening the fibres of the viſcera, and abating the acrimony of the humours. Some give from a ſcruple to half a drachm, in ſpitting of blood and inveterate coughs. Externally laid to the temples, it is ſaid to cure the tooth-ach.

OLIBANUM, *Olibanum*, is of a reſinous ſubſtance, of a pale yellowiſh colour, and tranſparent, it is brought in tears like maſtich, but bigger, and is of a bitteriſh taſte, and pretty acrid, but not diſagreeable, and of a fragrant ſmell. It readily takes fire, and flames a long while. That is beſt that is whitiſh, tranſparent, pure, ſhining, and dry. Some have accounted it a ſpecific againſt a pleuriſy, and commend it in diſorders of the head and breaſt, eſpecially coughs and ſpitting of blood. The doſe is from a ſcruple to two drachms. A drachm of it, put into an apple, roaſted under the aſhes, and given to the patient, has been obſerved to cure thoſe who have been given over in a pleuriſy; but then they muſt be well covered in bed in order to ſweat. If the firſt doſe does not ſucceed, another muſt be given in ſix hours time. It is accounted a good vulnerary, and therefore is mixed in various plaſters.

SANDARACHA, *Gum Sandarach*, is a dry, inflammable, tranſparent, reſinous ſubſtance, of a pale yellow colour, and brought in tears like maſtich. The taſte is reſinous, but the ſmell when it is kindled is fragrant and ſweet. That is beſt that is yellowiſh, tranſparent, and ſhining. It is brought from the coaſt of Africa, and has much the ſame virtues as maſtich, but is ſeldom given inwardly; nor is it very often applied outwardly. When powdered it is well known by the name of pounce, which is rubbed over paper to prevent the ſinking in of the ink, and to render the writing more fair; it is alſo an ingredient in ſome ſorts of varniſh.

SANGUIS DRACONIS, *Dragons-blood*, is a dry, brittle, reſinous ſubſtance, melting eaſily, and as readily taking fire. It is of a dark red, but when powdered is of an elegant crimſon; when drawn into thin plates it is tranſparent, but is without taſte or ſmell, unleſs when kindled; for then the fumes ſmell ſomewhat like ſtorax. There are two ſorts in the ſhops, one of which is hard and in maſſes, about an inch long, and half an inch thick, and is wrapped up in long narrow leaves. Dragons-blood in tears and drops is generally mixed with bark, wood, earth, or other heterogeneous ſubſtances, and then made into maſſes, or loaves, as ſome call them. There is another counterfeit ſort, that may be readily diſtinguiſhed from the true, for the maſſes are of a duſky red colour, and made up of ſeveral ſorts of gums, tinged with Braſil wood. It will not flame, but when placed over the fire riſes in bubbles, and being put into water diſſolves therein. That is beſt that is ſhining, of a darkiſh red, wrapped in leaves, and when powdered is of a fine red ſhining colour. It is brought from the Eaſt Indies, and is produced by four different trees; however, that which is genuine will diſſolve only in ſpirits of wine and in oils. It is of an aſtringent quality, and is excellent in all ſorts of hæmorrhages whatever; the doſe is from half a drachm to a drachm, and when applied outwardly dries up ulcers, heals wounds, and faſtens looſe teeth; it is alſo of uſe to painters, in making a red ſort of varniſh.

STYRAX SOLIDUS, *Storax*, is a reſinous ſubſtance, of which there are two kinds, *Storax Calamite*, and *Common Storax*.

STYRAX CALAMITA, *Storax Calamite*, is a reſinous, ſhining, ſolid, ſomewhat fattiſh ſubſtance, which is compoſed of reddiſh and whitiſh grumes or grains, of a reſinous, acrid, but not diſagreeable taſte, and a moſt fragrant ſmell, eſpecially when thrown on live coals; it takes fire readily, and emits a very bright flame.

STYRAX VULGARIS, *Common Storax*, is of a yellowiſh red, or browniſh colour, which is ſhining, fat, and a little clammy, and is brought in maſſes mixed with whitiſh grains; it has the ſame ſmell and taſte as the former. There is alſo another ſort of ſtorax which is mixed with ſaw-duſt, and this is now commonly ſold in the ſhops, and is oftener met with than the true. It is good in diſeaſes of the

breaſt, and is ſaid to ſtrengthen the brain, refreſh the ſpirits, and reſtrain their inordinate motions; it has alſo an anodyne faculty, and is good in pains of the head, and inveterate coughs, by abating the acrimony of the humours. The doſe is from half a ſcruple to half a drachm.

TACAMAHACA, *Tacamahac*, is a reſinous, dry, fragrant ſubſtance, of which there are two kinds in the ſhops, but that in ſhells is the beſt. It is a little ſoft, ſometimes pale, ſometimes yellowiſh, and at other times greeniſh. It is brought in ſhells, which ſeem to be of the gourd kind, and covered with leaves. It has a moſt fragrant aromatic and very ſweet ſmell; but it is ſeldom met with in the ſhops. The common ſort conſiſts of whitiſh grains, or glebes, but they are ſometimes yellowiſh, reddiſh, greeniſh, or variegated with all thoſe colours, and ſemi-tranſparent. The ſmell is much like the former, but not ſo diſagreeable, and it is brought from New Spain. It is ſeldom or never given inwardly, but is applied outwardly for eaſing of pains ariſing from cold flatulent humours; it reſolves and ripens ſwellings, and reſtrains defluxions on the eyes, and other parts of the face. When laid to the temples, it is much praiſed by ſome for curing the tooth-ach, and on being applied to the ſtomach, it ſtrengthens it, and aſſiſts digeſtion.

Natural History of GUMS.

GUMMI ARABICUM, *Gum Arabick*, is brought over to us in tears, or drops, of different colours, ſome of which are pale, others yellow, and others red, with a wrinkled ſurface, and brittle, and which ſhines like glaſs when broken. When held in the mouth it ſticks to the teeth, and diſſolves readily in water, but has no taſte. It is produced by a tree called the *Acacia Vera*, or the *Egyptian Thorn*, and is brought over from Arabia, Egypt, and other parts of Africa. The beſt is whitiſh, or of a paliſh yellow, ſhining, dry, tranſparent, and free from filth. When it is brought over in large reddiſh dirty maſſes, it is only fit for mechanical uſes. It will not diſſolve in ſpirits of wine, or oil, and in the fire it burns to aſhes without flaming, whence it appears to conſiſt of a mucilage and earth; whence it is good in hoarſeneſſes, coughs, ſalt catarrhs, ſpitting of blood, the ſtranguary, and heat of urine. The doſe is from a ſcruple to two drachms. When a powder of this gum is wanted, it muſt be beaten in a red hot mortar, and then the powder of it may be exhibited for internal uſe.

GUMMI SENECA, *vel* SENICA, *Gum Seneca*, is not unlike gum arabick, and is called Senega, becauſe it is brought from a province of Negroeland, bordering upon the river Senegal. We now have it in great plenty, and at preſent the whole trade is in our own hands, but from what tree it is obtained we are uncertain, though perhaps it may be a kind of an acacia. The white and ſmaller tears of this gum are often ſold for the true gum arabick; and there is no great cheat in the matter; for their qualities and properties are much the ſame.

TRAGACANTHA, TRAGACANTHUM, and DRAGACANTHUM, *Gum Tragacanth*, is a gummy juice, ſometimes brought over in long ſtrings variouſly contorted and bent, and ſometimes in ſmall grumes, or bits; it is white, ſemi-tranſparent, and ſometimes yellowiſh, reddiſh, or blackiſh. It is dry, but not very hard, and without either ſmell or taſte. It is brought from Cyprus, Aſia, and Greece. That in ſtrings like worms or iſinglaſs is beſt, when it is white and free from filth. It ſerves for the ſame purpoſes as gum arabic; and it is obſervable that a drachm of it will thicken a pint of water, full as much as an ounce of gum arabick, it being altogether a mucilage without any earthy parts. It is good in dry ſharp coughs, hoarſeneſſes, and other diſorders of the breaſt, ariſing from an acrid lympha; as alſo in the ſtranguary, and ulcers of the kidnies; it is alſo of uſe to abate the heat of the mouth and tongue, and to heal the painful chaps of the nipples. It is beſt taken diſſolved in ſome convenient water, and the doſe is from half a ſcruple to two drachms. It is never uſed externally, but ſerves the apothecaries for making troches.

MANNA, *Manna*, is a ſort of gum, which flows ſpontaneouſly from ſeveral ſorts of trees, and afterwards congeals into grumes in the form of an eſſential oleous ſalt; it not only proceeds from the aſh and quicken-tree, but alſo from the larix, pine, fir, oak, juniper, maple, olive, fig-tree, and other plants; for which reaſon it differs in form and conſiſtence, according to the place and tree from whence it was gathered; for ſome is liquid, and of the conſiſtence of honey, and another ſort is concreted into grains like maſtich, and another again into grumes or ſmall maſſes. *Manna* is alſo divided into the Oriental and European, the firſt of which is brought from India, Perſia, and Arabia.

MANNA CALABRA, *Calabrian Manna*, is ſometimes in grains, ſometimes in tears, and ſometimes in grumes or ſmall maſſes; it is brittle and whitiſh while freſh, and ſomewhat tranſparent; but in time grows reddiſh, and in moiſt weather turns to the conſiſtence of honey; it is as ſweet as ſugar, with a kind of an acridity. That is beſt which is white or yellowiſh, light and concreted into grains or grumes in the ſhape of icicles; but that which is fat, like honey, or blackiſh and dirty, is not good; for ſometimes this is counterfeited with coarſe ſugar, honey, and a little ſcammony; likewiſe that which is white, opaque, ſolid, heavy, and not in the ſhape of icicles, is bad, becauſe it is nothing but ſugar and manna boiled together. This counterfeit ſort may eaſily be diſtinguiſhed from the true by its denſity, weight, opacity, and taſte. This manna in Calabria and Sicily flows ſpontaneouſly from two ſorts of aſh-trees, and is found on the boughs and leaves in the ſummer months, unleſs prevented by rain. When the weather is dry, it flows from the trunk and large boughs of theſe trees, from the twentieth of June to the end of July, and from noon till evening, in the form of a limpid fluid, which concretes into various grumes, and grows white and dry. They gather it the next day, ſcraping it off with wooden knives, if the weather is fair; but if it ſhould chance to rain, the manna is loſt. When July is paſt, they make inciſions into the bark of the aſh and quicken-trees, and from noon till evening a liquid flows out, which concretes into thicker grumes, which are ſometimes very large, and require a day or two to bring it to a proper conſiſtence; this is redder than the former, and is ſometimes blackiſh, on account of the earth and other filth mixed therewith.

MANNA DI FRONDE flows ſpontaneouſly in July and Auguſt, from about the nervous fibres of the leaves, which being dried in the air concrete into whitiſh grains of the ſize of wheat; inſomuch that in Auguſt the greater leaves of the aſh-tree look white, as if they were covered with ſnow; however, this is very ſcarce, on account of the difficulty of gathering it. The virtue of manna is well known, it being a mild laxative purge, and is thought to diſſolve groſs humours, and to abate their acrimony; whence it is good in catarrhs and coughs, proceeding from an acrid phlegm. It is alſo good in diſorders of the breaſt and lungs, when ſtuffed with clammy humours. It is alſo uſeful in the pleuriſy, inflammation of the lungs, and tenſion of the belly, from a thick hot bile. The doſe is from one ounce to three, and Hoffman, in ſome particular caſes, has given to four.

NATURAL HISTORY of GUM RESINS.

AMMONIACUM, *Gum Ammoniac*, is a concreted juice, of a middle nature between a gum and a reſin; it is compoſed of little lumps, or maſſes, ſhining here and there with bits that are milk white, or reddiſh; but the ſubſtance itſelf is a little browniſh, and not unlike benjamin; but it is ſometimes in tears. It is ſometimes yellowiſh on the outſide, and of a yellowiſh white within; the taſte is ſweetiſh at firſt, but afterwards bitteriſh, and the ſmell is fragrant, not unlike that of galbanum, but ſtronger. When chewed, it grows whiter and whiter by degrees, and when thrown upon burning coals, it will flame; it will diſſolve in vinegar or hot water, and is brought from Alexandria in Egypt. The tears are beſt for internal uſe, eſpecially when pure, dry, and without mixture. Ammoniac incides groſs humours, and is good in the aſthma, in crude tubercles of the lungs, and is in general a great aperient. The doſe is from half a ſcruple to a drachm, in the form of an emulſion, electuary, bolus, or pills. Outwardly it is diſcutient, and is of great uſe in ripening tumours.

ASSA-FŒTIDA is a kind of gum reſin, and is of the conſiſtence of wax; it is frequently bought in large maſſes, full of ſhining, whitiſh, yellowiſh, reddiſh, fleſh-coloured, or violet ſpots. It has a very ſtrong ſmell, ſomewhat like garlick, and has a bitter, biting, acrid taſte. It is brought from Perſia, and the Eaſt-Indies, and that is beſt which has the ſtrongeſt ſmell, and ſeems to be compoſed of tears reduced into maſſes. It proceeds from the wounded root of a tree, but never from any other part, and at firſt it is as fluid as cream, and of the ſame colour; but being expoſed to the air and ſun, it becomes browniſh and thick. It is preſcribed in the flatulent cholic, hyſterical diſorders, and for promoting ſecretions. It is diaphoretic, and promotes ſweat; it is good in diſorders of the nerves, and is of ſome uſe in a palſy. The doſe is from twelve grains to a drachm, and even to two drachms.

BDELLIUM, *Bdellium*, is a gum reſin, which is brought to us in maſſes of ſeveral ſhapes and ſizes, and has ſomewhat of the appearance of myrrh, it being of a ruſty reddiſh colour; but in the inſide it is a little tranſparent. It is brittle, of a bitteriſh taſte, and has no diſagreeable ſmell when kindled; it will flame for a conſiderable time, with a ſort of a crackling noiſe. It is a good emollient, and is effectual in diſperſing tumours of the glands.

EUPHORBIUM, *Euphorbium*, is a reſinous gum, and is brought to us in drops, or tears, of a pale yellowiſh, or gold colour; are bright, and of different ſhapes and ſizes, with a moſt acrid, burning, nauſeous taſte; but without ſmell. It is brought from the inland parts of Africa to Sallee, from whence it is tranſported into Europe. It is a moſt violent and dangerous purge, and often produces fainting and cold ſweats; for which reaſon various methods have been uſed to correct it, which are not worth mentioning, becauſe in whatever manner it is given it is never ſafe.

GALBANUM, *Galbanum*, is a fat ſubſtance, as ductile as wax, and is ſhining and ſemi-tranſparent, it being of a middle nature between a gum and a reſin. It is of a whitiſh colour while freſh, but afterwards grows yellowiſh or reddiſh. It has a bitter acrid taſte, with a ſtrong ſmell. That is beſt which is freſh, fat, pure, and moderately viſcous. When taken inwardly, its virtues are not unlike gum ammoniac, but weaker; however, it diſſolves thick phlegm, for which reaſon it is good in an aſthma, and old cough; it diſcuſſes wind, is good in the cholic, and opens obſtructions of the womb. Externally, it ſoftens and ripens ſwellings, for which reaſon it is mixed in various plaſters; being applied to the navel, it mitigates hyſteric diſorders, and ſpaſmodic motions of the inteſtines. The doſe is from one ſcruple to two.

MYRRHA, *Myrrh*, is a gum reſin, brought to us in grains or maſſes of various ſizes, ſome of which are as big as a hazel-nut, and ſome as large as a walnut; the colour is yellow, or rather of a ruſty red, and ſemi-tranſparent. The taſte is bitter, ſubacrid, and aromatic, but nauſeous, with a ſtrong ſmell, which ſtrikes the noſe when it is pounded or burnt. The beſt is brittle, light, of the ſame colour, bitter, acrid, and of a pretty ſtrong ſmell. It ſtrengthens the ſtomach, helps digeſtion, diſcuſſes wind, and is good in all cold cachectic diſeaſes, catarrhs, and all ſorts of ulcers. It is given in ſubſtance in the form of a bolus, or pills, from half a ſcruple to half a drachm. Externally it attenuates, diſcuſſes, and is an excellent vulnerary; it cleanſes old ulcers, preſerves them from putrefaction, and cures the caries of the bones. It is bad in all ſorts of hæmorrhages, as well as in ſpitting of blood, and ought not to be given to women with child, except with great caution. The tincture of myrrh is moſt in uſe, and is given from five drops to half a drachm. When outwardly applied, it often prevents gangrenes and mortifications; and that, which is improperly called the oil of myrrh, is good againſt freckles and pimples on the face.

OPOPANAX, *Opopanax*, is a gummy and reſinous juice, concreted into grains about the ſize of a pea, which are reddiſh without, and within of a whitiſh yellow; the taſte is intenſely bitter and acrid, and the ſmell is ſtrong. The beſt is in ſhining, fat, brittle tears, of a ſaffron colour without, and whitiſh or yellowiſh within; it is brought from the Eaſt-Indies, but we know not from what plant. It takes fire like reſin, and diſſolves in water, where it turns it of a milky colour. It incides groſs viſcid humours. diſcuſſes wind, and looſens the belly; it is good in hypocondriacal diſorders, obſtructions of the viſcera, and is an ingredient in the gummous pills of the ſhops. The doſe is from a ſcruple to a drachm.

SAGAPENUM, *Sagapenum*, is a juice between a gum and a reſin, and is ſometimes brought in grains, but more frequently in larger maſſes, which are reddiſh on the outſide, and within are of the colour of horn; it has a biting acrid taſte, with a ſtrong ſmell, and ſeems to be of a middle nature between aſſa-fœtida and galbanum. It will flame when held to a candle, and will diſſolve entirely in wine vinegar and hot water. That is beſt which is tranſparent, reddiſh without, and within full of whitiſh or yellowiſh ſpecks, and which grows ſoft when handled. It is good in diſorders of the breaſt, ariſing from a groſs phlegm; as alſo in hard callous ſwellings, eſpecially of the nervous parts. The doſe is from a ſcruple to half a drachm.

SARCOCOLLA, *Sarcocolla*, is a gummous juice, and ſomewhat reſinous; it conſiſts of ſmall whitiſh grains, or of a whitiſh red, that are ſpongy, brittle, and now and then mixed with ſhining ſpecks; the taſte is ſubacrid and bitter, with a diſagreeable nauſeous ſweetneſs. It ſoftens between the teeth, and when held to a candle it firſt bubbles, but afterwards breaks out into a clear flame, and yet it diſſolves in water. It is brought from Perſia and Arabia.

NATURAL HISTORY of JUICES extracted by ART from PLANTS.

ALOE, *vel* SUCCUS ALOES, *Aloes*, is of three ſorts, the *Succotrine*, the *Hepatic*, and the *Caballine*. The firſt is brought from the iſland of Succotora, near Arabia, and is the beſt and pureſt

pureſt of them all; it is of a reddiſh or ſaffron colour, and when broken is ſhining, and, as it were, tranſparent; the taſte is bitter, aſtringent, and ſomewhat aromatic, with a ſtrong, but not diſagreeable ſmell. The *Hepatic* is denſe, dry, opaque, and of the coleur of liver, with a ſtrong ſmell and taſte. *Caballine*, or *Horſe Aloes*, is the worſt of all, and is heavy, denſe, black, and full of ſand; it has an exceeding bitter nauſeous taſte, and a very ſtrong diſagreeable ſmell. The beſt Succotrine Aloes is ſhining, tranſparent, fat, and brittle in the winter, but in the ſummer a little ſofter, and is of a yellowiſh or purple reddiſh colour, but when powdered is of a ſhining gold colour, with an aromatic bitter taſte, and a ſtrong aromatic ſmell, almoſt like myrrh. Succotrine Aloes is the beſt for internal uſes, and the Hepatic for external, but the Caballine is only for horſes. Aloes in general is not only a purge, but is a remedy againſt diſorders of the bile; but if it be given in too large a doſe, or too often, it is apt to create hæmorrhages, and particularly the piles. Aloes has this peculiar property, that a few grains of it will looſen the body as much as a ſcruple. Some give it from one ſcruple to two ſcruples in ſubſtance; but the moſt common way of taking of it is in tinctura ſacra.

SCAMMONIUM, *Scammony*, is a concrete reſinous and gummous juice, and is a noted purge. There are two ſorts, one of which is brought from Aleppo, and the other from Smyrna; the firſt is light, ſpongy, brittle, and of a blackiſh aſh colour, ſhining when broken; when it is pounded it turns to a whitiſh or aſh coloured powder; it has a bitteriſh acrimonious taſte, and a very ſtrong ſmell. *Smyrna Scammony* is more denſe and heavy, and of a black colour. However, that Scammony is beſt, which will readily break and powder, and bites, or burns the tongue very little, but when mixed with ſpittle turns whitiſh like milk. The black, heavy, and impure, is bad. All ſtrong purges are in ſome ſenſe or other dangerous, and this in particular is not without its bad effects; for ſometimes it purges too violently, and at other times not at all; it is ſometimes attended with ſickneſs, and produces wind, as well as occaſions thirſt and a fever. Therefore the beſt way is to grind it with ſugar, ſo as to divide its reſinous particles, and then it may be given ſafely to ten or twelve grains.

GUMMI GUTTA, *Gumboge*, is a concreted juice, partly of a reſinous, and partly of a gummous nature; it is inflammable, denſe, dry, hard, ſhining, opaque, and of a yellowiſh ſaffron colour; it is brought over in pieces of various ſizes, and has very little or no taſte. It will diſſolve both in wine and water, in which laſt it will turn a little milky, and yet tinge any thing with yellow: When held to the candle it will flame, and emit a copious ſmoke. It is reckoned among the violent purges, and brings away ſerous humours, as well upwards as downwards, and that ſpeedily, though it will not gripe. It is frequently uſed in the dropſy, cachexy, jaundice, catarrhs, and other chronic diſorders. It has been given from two to fifteen grains, and from two to four grains it will not vomit, but from four to eight grains it will both vomit and purge without violence, eſpecially if plenty of water gruel be drank after it. The beſt way is to give it either in a bolus or pills; however, it ſhould be uſed with caution, eſpecially becauſe vomiting will not ſuit with ſome patients.

OPIUM, *Opium*, is a concreted reſinous and gummous juice, which is heavy, denſe, clammy, inflammable, and of a blackiſh colour. It has a ſtrong ſoporiferous ſmell, with an acrid bitter taſte, and is uſually brought over in roundiſh cakes about an inch thick, and weighing from half a pound to a pound, which are wrapped up in poppy leaves. It is brought from Natolia, Egypt, and the Eaſt Indies. Authors differ greatly about the effects of Opium; however, it is certain that in a proper doſe it will generally procure ſleep, and eaſe pain; we ſay generally, becauſe it will keep ſome waking, and prevent ſleep; though at the ſame time it will eaſe their pains. Too large a doſe, that is a few grains, will not only produce ſleep, but blunt all the ſenſes, hinder breathing, and prevent the patient from ever waking again. It is doubtleſs a moſt uſeful remedy, and will ſtop the proceſs of many diſeaſes; but then it is palliative only, and never cures any. It is exceeding hurtful to the weak, and ſhould never be given where the motions of the patient are languid; likewiſe in ſome cholics it has often produced paralytic diſorders; for which reaſon it ſhould never be given to infants, and perſons weakened with age. When exhibited in a proper doſe, it excites an agreeable ſenſation, and inclines to mirth, like a moderate quantity of wine; for which reaſon the Turks always take large doſes of it when they are going to engage in a battle. It ſtops all ſenſible evacuations for a time, except ſweating, and enlarges the pulſe. When too large a doſe has been taken, it will be beſt to bleed and vomit, if the ſtrength will permit; and then acids muſt be given, as vinegar, and the juice of lemons, or ſpirits of vitriol, properly diluted. Some caſes will require ſtrong ſneezing powders, and bliſters or ſinapiſins applied to the ſoles of the feet and nape of the neck, with painful frictions, ſcarifications, or burnings. The doſe is generally a grain, but in ſome caſes two may be given.

ACACIA VERA, *True Acacia*, is an inſpiſſated gummous juice, brown or blackiſh without, and reddiſh or yellowiſh within; it is of a hard firm conſiſtence, of an auſtere aſtringent taſte, and is brought over in round maſſes, weighing from four to eight ounces. It is brought from Egypt. It is ſaid to ſtrengthen the ſtomach, ſtop vomiting and looſeneſſes, as well as ſome ſorts of hæmorrhages, by abating the acrimony of the humours, and ſtrengthening the ſolid parts. The doſe is from half a drachm to a drachm, in ſome convenient liquor.

CATECHU, improperly called Japan earth, is a gummy, reſinous, inſpiſſated juice, of a reddiſh black without, and a browniſh red within, with an aſtringent bitteriſh taſte, but no ſmell. There are two ſorts, whereof one is better than the other, and melts more readily in the mouth. It is brought from the Eaſt Indies, is a moderate aſtringent, ſtrengthens the gums, and is good in ſmall ulcers of the mouth, as alſo in coughs and hoarſeneſs. It ſtrengthens the ſtomach, helps digeſtion, and is good in looſeneſſes. The doſe is from half a ſcruple to a drachm.

SACCHARUM, *Sugar*, is of ſeveral ſorts, which are ſo well known to every one that they need no deſcription. Some are great enemies to Sugar, and affirm, it produces we know not what bad effects; but as thoſe who have uſed it very freely, have never received any damage from it, we may conclude it to be entirely harmleſs. Compoſitions of Sugar are allowed on all hands to be good in diſorders of the breaſt, and that, mixed with oil and ſweet almonds, it is good in coughs, hoarſneſſes, and the like. Externally, Sugar is a very great vulnerary, eſpecially when mixed with a little brandy, for then it will heal wounds, cleanſe ulcers, and prevent putrefaction.

TARTARUS, or TARTARUM, *Tartar*, is a ſaline hard ſubſtance, of an acrid and ſubauſtere taſte, which adheres to the bottoms and ſides of wine veſſels, from whence it is ſcraped off. It is of two ſorts, the white and the red, both of which proceed from wines, of the ſame colours. The beſt Tartar is heavy, hard, with that part next to the wine

wine riſing into chryſtalline points, but when broken appears like ſponge, or pumice ſtone, it being porous and mixed with earth, though it is a hard ſhining ſubſtance.

Tartar unprepared is ſeldom or never uſed internally; but is taken when purged, and then it is called cream or cryſtals of tartar; and is good to temperate the heat of the bile, and to quench thirſt in burning fevers. It attenuates groſs humours, opens obſtructions of the viſcera, and is good in cacheetic and hypocondriac diſorders. It is a laxative, and is often mixed with milder purges with ſucceſs. When given from half a drachm to two drachms it is an aperient only, but from half an ounce to an ounce it is a purge. Cream of tartar will not diſſolve in cold water, but it will in hot.

Salt of Tartar, which is procured by calcining tartar in an open fire, is a fixed alkali, and ſomewhat of a cauſtic quality. It ſerves for many chemical operations, and eſpecially to extract the reſinous and ſulphureous parts of medicine in making of tinctures. When given alone, diſſolved in a ſufficient quantity of water, the doſe is from twelve grains to half a drachm; it will attenuate groſs humours, and cure the heart-burn proceeding from acids in the ſtomach. Among the medicines that are uſually procured from tartar, are ſoluble tartar, vitriolated tartar, and emetic tartar.

NATURAL HISTORY of TUBERA, FUNGI, and Subſtances that adhere to certain VEGETABLES.

TUBERA CERVINA, or BOLETUS CERVINUM, *Deers Balls*, is a tuberoſe fungus, without a root, and is of a duſky yellow, with a hard, thick, and granulated rind; but the inſide is of a purpliſh white. It is of the ſize of a walnut, though ſometimes of that of a hazel nut, or leſs; and it is divided into cells that are ſoft and downy, in which are exceeding ſmall ſeeds, lying together in a maſs, and connected with filaments; when this ſubſtance has loſt its ſeeds, it is then contracted into a ſmall round ball. The ſmell and taſte when freſh are rank, but when dry and laid up for ſome time, they become almoſt inſipid. They are of little uſe, for they are never eaten, nor have they any remarkable qualities to recommend them for phyſical purpoſes, whatever authors have ſaid to the contrary.

AURICULA JUDÆ, or FUNGUS SAMBUCINUS, *Jews-ear*, is a membranaceous fungus, in the ſhape of an ear, from whence it has its name. It is a ſpongy ſubſtance, growing at the bottom of old alder trees, and is light, coriaceous, and membranaceous; it is aſh coloured beneath, and blackiſh on the top, and the taſte is earthly and flat, but it has no ſmell; it has little or no pedicle, but ſticks cloſe to the body of the tree. It is ſaid to be aſtringent and drying, but is ſeldom or never taken inwardly.

AGARICUS, or FUNGUS LARICIS, *Agaric*, is a fungous ſubſtance, of a roundiſh, angular, unequal ſhape, and of different ſizes, from the bigneſs of a man's fiſt to that of his head. It is very light, as white as ſnow, and may be readily rubbed into meal between the fingers; but it has a few fibres, and a callous aſh coloured reddiſh rind, whoſe lower part is perforated by exceeding ſmall ſeeds that lodge in the holes; the taſte is at firſt ſweetiſh, then bitter, acrid, and nauſeous, with a ſlight aſtringency. It grows to the trunk of the larch tree, and is ſeldom or never found on the boughs. The beſt is white, light, and brittle. It goes under the denomination of a purge, though ſome deny it has any ſuch quality, and is at beſt a uſeleſs medicine.

AGARICUS PEDIS EQUINI FACIE, *Touchwood*, or *Spunk*, grows to the aſh and other trees; but that is ſuppoſed to be the beſt that grows to old oaks that have been lopped, and which has been gathered in Auguſt and September. This has of late been mightily cried up for ſtopping of blood upon the amputation of a limb, without making any ligature; but it has had the fate of many new diſcoveries, and is now almoſt entirely laid aſide; though it might doubtleſs be of uſe in many caſes. The inward part is beſt which feels to the touch like buff, which muſt be taken out, and beaten a little till it may be eaſily teazed between the fingers. This being done, ſo much of it muſt be applied to the wound as will ſomewhat more than cover it, and over this a broader piece muſt be laid with proper bandages.

CHAP. II.

Containing the NATURAL HISTORY *of* INDIGENOUS HERBS, PLANTS, SHRUBS, *and* TREES, *and their various uſes in Medicine.*

INDIGENOUS plants are thoſe which are produced in our climate, ſome of which have been, or are, uſed in medicine; while others are quite uſeleſs, at leaſt as far as is hitherto known; and therefore they may be paſſed over in ſilence. In giving an account of them, we ſhall obſerve an alphabetical order, that each of them may be more readily found.

ABROTANUM MAS, *Southernwood*, of which there are two kinds of uſe in medicine, one of which is called the male, and the other the female; but the firſt of theſe is properly the Southernwood. In its characteriſticks it is much the ſame as wormwood, and its root is woody, with a few fibres proceeding from it. It has many branches, which ſometimes riſe to the height of four cubits, though they are generally much lower; they are hard, brittle, and full of a white pith, ſomewhat of a reddiſh colour, and are ſtreaked and branched. It has many leaves, ſomewhat broader than thoſe of fennel; and thoſe below are divided into ſeveral parts, but thoſe above have only one or two ſegments. They are of a hoary colour, with a ſtrong agreeable ſmell, and a bitteriſh taſte. The flowers on the ſides of the branches are like thoſe of wormwood, and conſiſt of many ſmall bloſſoms that are tubulated and divided at the top into five parts, in each of which there is a ſingle ſeed, and they are all comprehended in a ſcaly cup. It is cultivated in gardens, by ſlips or cuttings, planted in the beginning of April on a bed of light freſh earth, obſerving to water them two or three times a week, till they have taken root. Theſe leaves are often uſed in fomentations.

ARBOTANUM FŒMINA, by ſome called *Santolina*, and *Chamæcypariſſus*, *Lavender Cotton*, has a thick, hard, woody root, from which there proceed branches above a cubit in heighth, which are woody, ſlender, covered with a hairy down, and divided into ſeveral branches, round which there are ſlender leaves about an inch in length, a little denticulated,

culated, or rather beſet with ſmall tubercles. They are all of a hoary colour, and of a phyſical ſmell, with ſomewhat of a ſweetneſs; the taſte is partly acrid, and partly of an aromatic bitter. On the top of each branch there is a yellow flower, conſiſting of ſeveral tubulous florets, divided at the top into five parts, with imbricated intermediate leaves, and contained in a common ſcaly cup. The cup of each floret, or embryo, turns into a ſtreaked oblong brown ſeed, not at all furniſhed with down. Theſe flowers are larger than thoſe of ſouthernwood, by which it may be diſtinguiſhed from it, as well as by the whole appearance of the plant. This plant is cultivated in gardens, and may be propagated by planting ſlips or cuttings during the ſpring, which ſhould be put into a border of light freſh earth, and watered and ſhaded in hot dry weather, until they have taken root. It is of little uſe in medicine, except in fomentations.

ABSINTHIUM VULGARE, *common Wormwood*, has a lignous and fibrous root, with ſtalks of an indeterminate height, branched out into many ſmall ſhoots, with hoary leaves of a bitter taſte, and furniſhed with ſpikes of naked flowers, hanging downwards, which are placed in long rows towards the top. They are compoſed of many tubulous florets, divided into five parts at the top, and are of a yellow colour; they are all contained in a common ſcaly cup, in each of which there is an embryo, which turns into a naked ſeed. It differs from other ſorts of wormwood, in having larger leaves and more jagged. It is very common in all parts of England by the ſides of high roads and in dunghills. It is planted in gardens for common uſe, and may be propagated by ſlips in March and October; or it may be raiſed from ſeeds, which may be ſown ſoon after they are ripe. Wormwood has always been looked upon as a valuable medicine, to promote the heat and circulation of the blood, and to recover the oſcillation of the fibres while ſluggiſh; by which means the groſs humours are attenuated, and brought back into the common road of circulation. It reſtores the debilitated functions of the viſcera, and is an excellent ſtomachic. It is good in the dropſy, green ſickneſs, cachexies, and agues; which laſt it has often been known to cure. It alſo by its great bitterneſs is of ſome ſervice againſt worms, by reſolving the mucilaginous humours in which their eggs are contained; however, in all hot diſeaſes and in inflammatory diſpoſitions it is not ſafe.

ABSINTHIUM MARITINUM, *Sea Wormwood*, has leaves much ſmaller than the common; they are hoary on the upper ſide as well as the lower, and the ſtalks are alſo hoary all over. It grows wild about ſalt marſhes and near the ſea coaſts. The virtues are much the ſame as thoſe of the former.

ABSINTHIUM ROMANUM, *Roman Wormwood*, differs much in appearance from the former. It has a great number of ſmall and woody roots full of fibres, and the ſtalks are about a cubit in height, which are round, ſmooth, greeniſh, or of a reddiſh green or purpliſh colour. They are full of leaves from the top to the bottom, which have much the ſame appearance as thoſe of ſouthernwood, only they are ſhorter. The flowers are much like thoſe of common wormwood, but leſs. It is cultivated in gardens, and may be eaſily raiſed by the planting and cutting of ſlips in the ſpring or autumn. The roots of this plant creep ſo much, that they will ſoon ſpread over a large piece of ground. It is not ſo bitter as the common wormwood, but is more aromatic; for which reaſon it is more agreeable to the taſte. It has the ſame virtues as the common wormwood, but weaker.

ACANTHUS, BRANK-URSINE, has a thick fleſhy root, black without, and white within, from whence proceed great numbers of fibres. The leaves that lie on the ground are a cubit in length, and a ſpan in breadth; but the ſtalks riſe to two cubits high, are ſtrong, and adorned with a long row of flowers elegantly diſpoſed like a thyrſis. The leaves are ſomewhat like thoſe of a thiſtle, and after them the Romans adorned the capitals of the Corinthian order of columns; that is, with the ſhape of theſe leaves; they were likewiſe imitated by embroiderers, in the time of Virgil. The flowers are labiated, and are of a ſort of a fleſh colour; the under lip of the flower is divided into three ſegments, which at the beginning is curled up in the form of a ſhort tube. There is no upper lip, but in its place there are ſtamina that ſupport the pointals, and the cup of the flower is compoſed of prickly leaves; the upper part of which is bent over like an arch, and ſupplies the defect of the upper lip of the flower. The piſtil ariſes from the hinder part of the flower, and turns to a fruit in the ſhape of an acorn, which is divided into two cells, each containing a ſingle ſmooth ſeed. The whole plant is full of a glutinous and mucilaginous juice. It grows ſpontaneouſly in Sicily and Italy; but is here cultivated in gardens, and is eaſily propagated by parting the roots in February or March, or by ſowing the ſeeds at that time. It is ſeldom uſed in medicine.

ACETOSA, *common Sorrel*, has a long, fibrous, yelloviſh, bitter root, and leaves placed alternately on the ſtalk, in the ſhape of a ſpade. The ſtalk is ſtreaked a foot in length, and is divided into ſeveral branches. The impalement of the flower is compoſed of three ſmall leaves that are bended back, and the flower has three leaves, which are larger than thoſe of the impalement. In the center of the flower is a three cornered pointal, or piſtil, ſupporting three ſmall ſtyles, which are attended with ſix ſtamina. It afterwards becomes a triangular ſeed, incloſed by the petals of the flower; in ſhort, it agrees with the dock in all its characters, except in having an acid taſte. It is but a ſmall plant in the fields, but in the gardens it produces large leaves. It muſt be ſown early in the ſpring, in a ſhady moiſt border; and if it be afterwards planted out into another ſhady border, it will produce ſtill larger leaves, and continue longer. The medicinal virtues are to cool and quench thirſt, and their decoction makes a uſeful drink in fevers. It is alſo an excellent antiſcorbutic.

ACETOSA ROTUNDIFOLIA, *round leaved or French Sorrel*, has the ſame characters as the former excepting the leaves, which are now and then almoſt round. This is the beſt ſort for the kitchen uſe, for which reaſon it is often planted in gardens. The roots are very apt to ſpread, by which means it is eaſily propagated, and muſt be planted at larger diſtances, that is, a foot ſquare at leaſt. It is a cooler like the former, and quenches thirſt as well as excites an appetite.

ADIANTHUM VERUM, *the true or French Maiden-hair*, is a capillary plant, and has a fleſhy fibrous root, from whence ariſe ſlender, black, ſhining, branched pedicles, above a palm in height, which ſuſtain leaves placed alternately, that are about a quarter of an inch broad, and ſomewhat ſhorter; they are green, creſted, ſmooth, and ſtreaked as it were with rays, and are like thoſe of coriander. It ſeems to be without ſeeds; however, in September, certain notches appear in the leaves, which adhere to each other, and contain a fruit or round membranaceous capſula, which is very ſmall and ſurrounded with an elaſtick ring, which by its contraction opens the capſula, which then emits a ſeed like duſt, that is too ſmall to be examined by the naked eye. It grows ſpontaneouſly in the northern parts of France, and continues green all the year. This herb was formerly celebrated for its pectoral virtues,

virtues, but is now greatly neglected. A ſyrup is made of this herb, which is ſold in the coffee-houſes, and called Capilaire; but it is generally ſuppoſed to be counterfeit.

AGNUS CASTUS, *the Chaſte-tree*, is a ſhrub full of branches, ſo tough that they are not eaſily to be broken. The leaves are joined to a pedicle an inch or two long, and divided into five particular leaves, of an oblong ſhape, and ſharp at both ends. The flowers grow in ſpikes, and are of a purple, or purple and white colour. They conſiſt of one leaf, which looks as if it had two lips, and the fore part is tubulous. From each calyx ariſes a pointal, or piſtil, which is fixed on the back part of the flower like a nail, and afterwards turns to an almoſt ſpherical fruit like pepper, divided into four cells, containing oblong ſeeds. It is cultivated in gardens, is very hardy, and may be propagated by planting the cuttings early in the ſpring, before they ſhoot. They require a freſh light ſoil, and muſt be frequently watered till they have taken root. They will grow to eight or ten feet high, and flower in autumn; the flowers grow in ſpikes at the extremity of every ſtrong ſhoot. This ſhrub is acknowledged to be good in hyſterical complaints, and in hypocondriacal ſpaſms, eſpecially if they proceed from groſs viſcid humours. The ſeed, in powder, is given from half a drachm to a drachm, or in an emulſion.

AGRIMONIA, *Agrimony*, has a blackiſh, thick, fibrous root, and a hairy branched ſtalk, two cubits high, with leaves above a palm in length, alternately placed, which are rough, hairy, pennated and grow alternately on the branches. The calyx, or flower-cup, conſiſts of one leaf, which is divided into five ſegments, and the flowers, which have five or ſix leaves, form a long ſpike, which expand in the form of a roſe, and are of a yellow colour. The fruit is oblong, dry, and prickly like a burdock, and in each there are two kernels. It is common in the hedges in many parts of England, and is noted for its aſtrictive quality. It is ſaid to be good in the cachexy, dropſy, jaundice, and in fevers ariſing from the obſtructions of the viſcera. It is alſo good in ulcers of the kidnies. The doſe of the dried leaves is a drachm in a proper vehicle.

ALCEA, *Vervein Mallows*, have a woody whitiſh root, from whence proceed ſeveral ſtalks to the height of a cubit, which are round, full of pith, and thinly beſet with longiſh hair. The leaves that proceed from the root and lower part of the ſtalks are roundiſh, with inciſures on the edges; but thoſe that grow near the top, and placed alternately, are remarkably jagged, and of a blackiſh green colour and hairy, particularly on the lower part. The flowers are like thoſe of mallows, and of a purpliſh fleſh colour, though they are ſometimes white; they are ſucceeded by ſeeds, which are black when ripe, are ſhaped like thoſe of mallows, and have the ſame faculties as that plant.

ALCHIMILLA, *Ladies Mantle*, has a root as thick as one's little finger, and is fibrous and black; from whence ariſe long pedicles, a palm and a half in length, which are hairy, and each ſuſtain a ſingle leaf, nearly like that of mallows, but more hard and criſp, and divided into eight or nine acute angles. The cup of the flower is divided into eight ſegments, which are expanded in the form of a ſtar; the flowers are collected into bunches on the top of the ſtalk, which conſiſt of ſeveral ſtamina with yellowiſh heads. The calyx becomes a capſula, containing generally two little round yellow ſeeds. It delights in mountainous places, ſuch as the Alps and Pyrenees. It alſo grows wild in ſome parts of England. This plant is ſeldom made uſe of in medicine.

ALKEKENGI, *the Winter Cherry*, has a geniculated root beſet with ſmall fibres, from whence ariſe reddiſh hairy branched ſtalks, a cubit in height, from the knots of which ariſe two leaves with long pedicles. The leaves are like thoſe of garden nightſhade, and the flowers conſiſt of one leaf, expanded at the top, and of a whitiſh colour, but of a pentagonal figure. The fruit, which is about the ſize of a cherry, is incloſed in the flower cup, and ſwells over it in the form of a bladder. The fruit is only in uſe, and is good to promote urine, as well as to cleanſe the kidnies and bladder. From three to eight of theſe cherries may be taken as a doſe, and are ſaid to have had a very good effect in preventing the gout, when eight of them were taken every change of the moon. It is very common in Engliſh gardens, and the fruit, which is ripe in October, often continues till the beginning of December. It is of the ſize of a common cherry, and of a fine red colour; the bladder that incloſes it is of a deep red, which burſts when ripe, and expoſes the fruit to ſight. It may be propagated by ſowing the ſeeds in the ſpring, or by the roots, which creep very much, ſo as to overſpread a large tract of ground; and therefore they ſhould be placed in pots, and ſet in a ſhady place in ſummer. If well watered in dry weather, it produces great numbers of cherries.

ALLIUM, *Garlick*, has a bulbous root, conſiſting of ſeveral membranes, and is of a whitiſh colour, with a purpliſh caſt. The leaves are oblong, and not fiſtulous as in onions, but like graſs, and the flowers conſiſt of ſix whitiſh leaves, with a piſtil in the middle, which turns into a roundiſh fruit of the ſize of a pea, and of a purpliſh colour without, but the pulp within is whitiſh. It is divided into three cells, full of roundiſh and blackiſh ſeeds. Garlick is proper to warm and ſtimulate the ſolids, and to diſſolve the groſs clammy fluids, whence it is good in cold conſtitutions, and in moiſt aſthmas, as well as all defluxions on the breaſt. It has been found very ſerviceable in the dropſy, for it will ſometimes cure it without any other medicine. It may be given alone, in a decoction, or made into a ſyrup; but it muſt be avoided in all inflammatory diſpoſitions and hot diſeaſes. It may be eaſily propagated in gardens, by planting the cloves, or ſmall bulbs, in Auguſt or September, about four or five inches from each other. In the middle of June the leaves ſhould be tied in knots, to prevent their running to ſeed, and then the bulb will be greatly enlarged. Towards the end of July, the leaves will begin to wither, and then the root ſhould be taken out of the ground, and hanged up in a dry room.

ALNUS, *the Alder-tree*, is ſtrait and upright, and of a moderate thickneſs, with a rough, brittle, blackiſh bark. The wood is reddiſh, ſoft, light, eaſily worked, and the boughs are very brittle. The leaves reſemble thoſe of the hazle, and the male flowers, or catkins, are produced at remote diſtances from the fruit, which is ſcaly, conical, and of the ſize of a hazle-nut. The bark, catkins, and fruit, are aſtringent, and the decoction has been preſcribed in inflammations of the tonſils, as a gargle. Some recommend the bark in intermitting fevers.

ALTHÆA, *Marſh-mallows*, has a great number of white roots, about as thick as a finger, which all proceed from one head. The ſtalks are a cubit or two in height, and are ſlender, round, villous, and beſet with leaves alternately, which are roundiſh, but ſharp at the end, hoary, and beſet with a ſoft down; they are about three inches long, and are ſinuous and ſerrated. The flowers come out between the pedicles of the leaves and the ſtalk, and are of a pale reddiſh colour. They are monopetalous, but divided into five ſegments, almoſt to the center, in which is a pyramidal tubulou ſtyle, loaded with ſtamina; and in the cavity there is a piſtil, which

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turns into a round flat fruit, conſiſting of ſeveral capſula, diſpoſed like a ring about the cake in the middle. Marſh-mallows is very much in uſe to abate the acrimony of the urine; in diſorders of the lungs, to thicken a ſharp ſalt defluxion; and conſequently is good in hoarſeneſſes, coughs, catarrhs, and the aſthma. It is likewiſe good in eroſions of the inteſtines, its decoction being drank, or given in cliſters. It is alſo good for ſoftening hard tumours, and eaſing pain. The leaves are much preferable to the roots. Syrup of marſh-mallows is a medicine commonly known, and is often preſcribed to render the urinary paſſages ſlippery to thoſe who are troubled with the gravel.

AMYGDALUS, *the Almond-tree*, has ſtrong branched roots, with a rough trunk, and leaves like thoſe of the peach tree, which are ſharp at the ends, and crenated on the edges. The flowers are roſaceous, conſiſting of five petals, of a whitiſh, or light purpliſh colour; the calyx is ſingle, but divided into five ſegments, with a piſtil that turns to a fruit an inch in length, which is long and flat. The outer coat is thin and pretty dry when ripe, under which is a ſhell that is not ſo rugged as that of the peach. As for the almonds themſelves, they are too well known to need a deſcription. When they are bruiſed, they yield a large quantity of limpid oil, and when made into an emulſion with water, have a ſweet pleaſant taſte, but if it be kept long it will turn ſour like milk. Sweet almonds, when freſh, are nouriſhing, but they ſhould be well chewed before they are ſwallowed. In all medicinal uſes they ſhould be blanched, that is, the outer ſkin ſhould be taken off. The emulſion of ſweet almonds is preſcribed in burning fevers, too great watchfulneſs, heat of urine, and inflammations of the kidnies and bladder, as well as in all caſes where the acrimony of the humours is to be corrected. It is given from one to four, and in ſome caſes to eight ounces, and ſhould be repeated every third or fourth hour. When children are griped, it ſhould be given by ſpoonfuls, mixed with ſyrup of marſh mallows.

AMYGDALUS AMARA, *the bitter Almond tree*, agrees with the former in all reſpects, except the bitterneſs of the fruit. They have been found to be poiſonous when given to dogs and ſome other animals, but they may be eaten by men without any damage. The oil that is expreſſed from bitter almonds differs in little or nothing from the former, and may be uſed in the ſame caſes; as alſo for ſoftening the wax in the ears, when put therein with a bit of cotton wool. Almond trees are chiefly valued for the beauty of their flowers, which are produced early in the ſpring, and make a fine appearance. They are propagated by inoculating one of their buds into a plumb, almond, or peach ſtock, the latter end of July. The beſt ſeaſon for tranſplanting theſe trees into a dry ground, is when the leaves begin to decay; but for a wet ſoil, in February.

ANAGALLIS MAS, *male Pimpernel*, has a white ſingle root, with a few fibres, and the ſtalks are ſo weak that they lie upon the ground; they are of the length of a palm, are ſquare and ſmooth, and the leaves are placed by pairs, and ſometimes three at a time oppoſite to each other; but they have no pedicles. The lower ſurface is ſpotted with blackiſh red ſpots; and the flower conſiſts of one leaf, ſhaped like a wheel, and divided into five ſharp ſegments, which are of a purpliſh red, with purple ſtamina, on which are yellow heads. The flower cup is alſo divided into five parts, from which a piſtil ariſes, fixed in the middle of the flower like a nail, and turns to a fruit, or globous ſhell, which when ripe opens tranſverſely into two parts, one of which lies upon the other, and incloſes many angular wrinkled ſeeds. This is one of thoſe called the ſleeping plants, whoſe flowers open about eight o'clock in the morning, and never cloſe till paſt noon.

ANAGALLIS FŒMINA, *female Pimpernel*, differs only from the former in the colour of the flower, which is blue, and being common in our corn fields; but this is more ſcarce. The male pimpernel is uſed as a ſallad and a pot-herb in many parts of England.

ANETHUM, *Dill*, has a ſlender white fibrous root, with a branched ſtalk, a cubit and a half in length; the leaves are like thoſe of fennel, but leſs, and of a bluiſh colour, with a ſtrong ſmell. The flowers are placed at the top of the ſtalks in umbels, and are roſaceous, conſiſting of five yellow petals, whoſe calyx or flower cup is changed into two paliſh yellow ſeeds, which are oval, flat, ſtreaked, and have a foliaceous border. It is propagated from the ſeeds, which ſhould be ſown in autumn, ſoon after they are ripe, and thrive beſt in a light ſoil, where they are to remain, for they will not bear a removal. The ſeeds are only in uſe, and they have been commended in the flatulent cholic, and againſt wind. The eſſential oil is a carminative, and is given from two to four drops on a lump of ſugar.

ANISUM VULGARE, *Aniſe*, has a ſlender annual fibrous white root, with pleaſant green leaves, above an inch in length, which are divided into three parts, or particular leaves, which are ſmooth and crenated. On the upper part there are many diviſions, and the ſtalk is ramous, ſtreaked, hollow, and ſuſtains flowers diſpoſed in an umbel, which are ſmall, roſaceous, and conſiſt of five cloven white petals, with the flower cup, that turns into an oblong turbinated fruit, in which are two ſmall gibbous ſtreaked ſeeds, of a greeniſh aſh colour. The taſte and ſmell are ſweet and very agreeable. The ſeed is only in uſe, which contains a great deal of eſſential oil. It is numbered among the four hot ſeeds, and is recommended for the helping of digeſtion, in the wind, cholic, and in ſhortneſs of breath. It is good for gripes in children, and to increaſe milk in the breaſts of nurſes. The doſe, in powder, is from a ſcruple to a drachm, and that of the eſſential oil, from two drops to twenty.

ANONIS *ſive* ONONIS, *Reſt Harrow*, has roots above a foot long, which creep every way, and are not eaſily broken. The ſtalks lie on the ground, and are ſlender, tough, reddiſh, hairy, and full of prickles; they are beſet with leaves, placed three together alternately, and are roundiſh, ſlightly crenated, hairy, of a dark green colour, and glutinous to the touch. The flowers are papilionaceous, of a light purple, or fleſh colour, and grow in ſpikes at the top of the branches. The piſtil is near a quarter of an inch long, and conſiſts of one bivalved flat capſula, containing a ſingle ſeed in the ſhape of a kidney. It is ſaid to open obſtructions of the liver, and to cure the jaundice; but it is now out of uſe.

APARINE, *Gooſe-graſs*, or *Clivers*, has a ſlender fibrous root, with ſlender, quadrangular, geniculated, rough, climbing ſtalks, three or four cubits long. At every genicula, or knee, there are from five to ſeven leaves placed like a ſtar, which are narrow, rough and terminate in prickles. The flowers proceed from the knees towards the top, and are very ſmall, white, monopetalous, in the ſhape of bells, and divided into four ſegments, as well as the flower cup, which turns into a dry, hard, cartilaginous fruit, covered with a thin blackiſh ſkin, and conſiſt of two globes full of umbilicated ſeeds. It is met with almoſt every where in hedges. It is inciding and aperient, and not only promotes urine but ſweat. Two ounces of the juice have been found to be very ſerviceable in the dropſy, carrying off the water by urine.

APIUM PALUSTRE, *Smallage*, has a thick, whitiſh ſtrait root, deſcending deep into the ground, and is ſometimes deeply divided into different heads; it has an acrid, bitter, diſagreeable taſte, with a ſtrong aromatic ſmell; from the root proceed many leaves ſtanding upon long pedicles; they are reddiſh, ſtreaked, concave, and are divided into wings, or grow upon a branched rib; they are alſo cut into five ſegments, and are ſmooth, neat, juicy, and of a pleaſant green; when rubbed with the fingers they have a ſtrong ſmell, and the taſte is not very diſagreeable. The flowers proceed from the joining of the pedicles to the ſtalk, as well as the top, where they are collected into an umbel, and are ſmall, roſaceous, and conſiſt of five white petals; the calyx turns to a fruit, containing two very ſmall ſeeds, which are ſtreaked, aſh coloured, depreſſed on one ſide, and gibbous on the other. It delights in moiſt marſhy places, and is by ſome tranſplanted into gardens. The ſeeds are reckoned among the four leſſer hot ſeeds.

AQUILEGIA, *Columbines*, has a white root an inch thick, which is branched and fibrous, and of a ſweetiſh taſte. It has leaves like meadow rue, they being cut on the edges, and are bluiſh underneath, but above of a dark green, with a bluiſh caſt. The flowers are pendulous, and conſiſt of many petals unlike each other; from the middle of the flower ariſes the piſtil, beſet with ſtamina, which turns to a membranous fruit, conſiſting of many huſks, or pods, each of which is full of black ſhining ſeeds. The colours of the flowers are various, as blue, red, white, fleſh coloured, and green, upon which account it is cultivated in gardens, and they flower in May and June. For raiſing them, the ſeeds ſhould be ſown in a nurſery-bed in September, and in March following the young plants will appear above ground, which ſhould be tranſplanted in the middle of May into good freſh earth, and ſet at nine inches diſtant every way. At Michaelmas they may be removed into the borders of a flower garden, and the May following they will produce flowers. It has been looked upon as an aperient and ſudorifick; but it is now out of uſe.

ARGENTINA, *Silver Weed*, or *Wild Tanſey*, has a blackiſh root, which is ſometimes ſingle and ſometimes fibrous; the leaves are conjugated like agrimony, and they are deeply dentated on the edges; they have ſeveral ſmall leaves ſet between them, and the upper part is of an herbaceous green; but the under like that of ſilver, they being covered with a ſoft down. The flowers are placed ſingly on long hairy pedicles, and conſiſt of five petals of a gold colour, with a calyx divided into five ſharp parts, between which are many ſmall ones; and there are many ſtamina of the ſame colour, with heads thereon. The piſtil changes into a ſpherical head, a quarter of an inch in diameter, full of ſeeds of a yellowiſh colour, and like thoſe of poppies. Many phyſicians have a great opinion of this herb; for Boerhaave affirms it has the ſame virtues as the Peruvian bark. The doſe of the juice is from four ounces to ſix, and of the ſeeds to half a drachm.

ARMENIACA MALUS, *the Apricot-tree*, has roundiſh acuminated leaves, ſerrated on the edges, and four or five of them are placed together. The flowers, that come out early in the ſpring, before the leaves, are roſaceous, conſiſting of five whitiſh petals, diſpoſed in a ring, with a calyx divided into five ſegments, from which a piſtil ariſes that turns to a fleſhy ſucculent fruit, very well known. There are ſeven ſorts cultivated in the Engliſh gardens, which are, I. *The Maſculine Apricot*, which is the ſooneſt ripe of all, and has a ſmall roundiſh fruit, of a red colour towards the ſun, which as it ripens fades to a greeniſh yellow on the other ſide. It is only valuable for being ſooneſt ripe, for it has little flavour. II. *The Orange Apricot*, which is the next that becomes ripe, and is of a deep yellow. The fleſh is dry, and is better for tarts than for eating. III. *The Algier Apricot* ripens next, and is of an oval ſhape, only a little compreſſed on the ſides. It turns to a pale yellow or ſtraw colour when the fleſh is dry, with a faintiſh taſte. IV. *The Roman* is next, and is larger than the *Algier*, but not compreſſed on the ſides; the colour is deeper, and the fleſh is moiſter. V. *The Turky Apricot* is the next in order, becauſe it ripens later than the former, and is bigger than any of them, and has a globular ſhape. It is of a deeper colour, has a firmer fleſh, and a better taſte. VI. *The Breda Apricot* was brought originally from Africa, and is a large roundiſh fruit, turning to a deep yellow when ripe, and is of a deep orange colour on the inſide. The fleſh is ſoft, full of juice, and better taſted than any of the whole tribe. VII. *The Bruſſels Apricot* is the lateſt, it not being ripe till near the middle of Auguſt, unleſs expoſed to a ſouth ſun; however too much heat ſpoils the taſte. It is red on the ſide next the ſun, with many dark ſpots, and of a greeniſh yellow on the other ſide; the fleſh is firm and of a high flavour, but it often cracks before it is ripe. The beſt ſtandard trees are thoſe that are about two feet and a half, or three feet in the ſtem; but they may be planted as dwarfs againſt an eſpalier, where, with good management, they will produce a large quantity of fruit. Theſe fruits are all propagated by budding them on plumb ſtalks; and they are all, except the two laſt, planted againſt the walls, which ſhould be either eaſt or weſt. The borders under theſe walls ſhould be ſix feet wide at leaſt, and if the earth be two feet deep, or two and a half at moſt, it is enough. The ſoil ſhould be freſh earth from a paſture ground, taken about ten inches deep with the turf, and laid to mellow at leaſt twelve months before it is uſed, often turning it. The trees that are budded ſhould be but of one year's growth, and if the ſoil is dry, October is the beſt month for planting. At Michaelmas, or ſoon after, when the trees have grown, you muſt unnail the branches and ſhorten them, in proportion to their ſtrength; for a vigorous branch may be left eight or nine inches long; but a weak one only five or ſix. When they are ſhortened they ſhould be nailed as horizontally as poſſible.

With regard to the medicinal uſes of apricots, there is little to be ſaid, only that they agree beſt with perſons of hot conſtitutions; for in weak ſtomachs they readily corrupt, and then produce feveriſh diſorders, which however are eaſily cured with emetics and purges.

ARTEMISIA, *Mug-wort*, has a creeping fibrous root, about as thick as one's finger, with a ſweet aromatic taſte. The ſtalks grow to two cubits in height or upwards, and are round, ſtreaked, ſtrong, ſtiff, generally of a purple colour, and covered with ſhort hair; they have alſo pith in the middle, and are branched, with leaves thereon, placed alternately, that are not unlike thoſe of wormwood; they are of a dark green above, and hoary underneath, by which they may be diſtinguiſhed from wormwood. The flowers grow on the top of the branches like ſpikes, conſiſt of many florets of a purpliſh colour, and divided into five parts, which are comprehended in a ſcaly cup. Among the florets there are naked embryoes, which turn into a double capillament, which afterwards, as well as the embryoes of the florets, turn into ſeeds like thoſe of wormwood, but have not ſo ſtrong a ſmell. It is generally accounted anti-hyſteric, and is very often in uſe among the women for female diſorders. In ſome parts of the kingdom it is uſed as a pot-herb. The doſe of the dried herb is three drachms, drank in wine, and is ſaid to be a good remedy againſt the hip-gout.

ARUM, *Cuckow Pint*, or *Wake Robin*, has a tube-

roſe fleſhy root, as thick as one's thumb, but roundiſh, white, and full of a milky juice; the leaves are about eight inches long, a little triangular, and ſomewhat in the ſhape of the head of an arrow. The ſtalk riſes to a cubit in height, and is round, ſtreaked, ſuſtaining a membranaceous flower like an aſs's ear, contained in a ſheath of a whitiſh green, in which is a piſtil of a paliſh yellow, from which proceed berries, that are almoſt globous, and diſpoſed into an oblong head; they are of a reddiſh purple, ſoft, full of juice, and contain a ſeed or two, that are hard, ſmall, and roundiſh. The whole plant has a moſt acrid taſte that burns the tongue. The root is only in uſe, and when taſted bites the tongue ſo much, that it may be felt a whole day. It has many virtues, but is good in ſerous diſorders, the cachexy, the green ſickneſs, agues, the dropſy, the jaundice, and is excellent in all diſeaſes that proceed from clammy humours, as well as for opening the obſtructions of the viſcera. It is alſo good in a moiſt viſcid catarrhal cough, and to reſtore the tone of the ſtomach. It has this peculiarity, that it will cauſe thoſe to ſweat who can hardly be brought to it any other way, when taken to the quantity of a drachm in any good ſpirit; but if it be dried and taken in powder, then this medicine will fail. The beſt way of giving it is by beating the freſh root with gummy reſins, and making the maſs into pills. Outwardly it is very proper to cleanſe ulcers, particularly thoſe that are fiſtulous. The common doſe is from half a drachm to four ſcruples.

ASARUM, *Aſarabacca*, is an ever-green herb, which has a ſlender, angular, knotty, fibrous, aſh coloured root, with a bitteriſh, nauſeous, aromatic taſte, ſomewhat like garden valerian; the leaves are round, ſtiff, ſhining, of a dark greeniſh colour, and are ſuſtained by long pedicles; they are ſomewhat in the ſhape of an ear, for which reaſon they are called in French, *Oreille d'homme*, that is, man's ear. The flowers are hid in the leaves near the root, and are of a purple colour, which are ſcarcely perceivable, except the flower-cup, which is divided into three or four ſegments, and of a blackiſh purple colour. The fruit is divided into ſix cells, full of oblong ſeeds, that look like the ſtones of grapes. It delights in woody places, and is found wild in ſome parts of England, though but ſeldom. The flowers appear in April; but grow ſo cloſe to the ground as not to be ſeen, unleſs you put away the leaves with your hand. It is beſt raiſed by ſlips. The leaves are a ſtrong vomit, as well as the roots, working both upwards and downwards; but the leaves are chiefly in uſe, to make a ſneezing powder, and are ſaid to be the principal ingredient in Major's Patent Snuff.

ASCLEPIAS, *ſive* VINCETOXICUM, *Swallow-wort*, or *Tame Poiſon*, has a root full of fibres, which proceed from a ſingle head, and has an acrid, bitteriſh, diſagreeable taſte, with a nauſeous ſmell; the ſtalks are tough, hairy, and geniculated, and riſe to a cubit in height; the leaves are placed by pairs over againſt each other, and are a little hairy on the hedges; they are in the ſhape of the leaves of ivy, but are longer, more wrinkled, and have very ſhort pedicles. From the joints of theſe pedicles, with the ſtalk, proceed whitiſh monopetalous flowers, in the ſhape of a bell, and are divided into five parts, expanded in the form of a ſtar, with five apices of the ſame colour, and a cup divided into the ſame number of parts, with a piſtil fixed in the hinder part of the flower, like a nail, that turns to a fruit compoſed of two membranaceous huſks that open from the bottom to the top, incloſing many ſeeds, that are covered with fine down, and are fixed to the membrane like ſcales on the ſkins of fiſhes. It has no milky juice like dog's-bane, by which it may be diſtinguiſhed from it. It is propagated by parting the roots, either in ſpring or autumn, which will grow almoſt in any ſoil. It has been cried up as an antidote againſt poiſon, but is now neglected for that purpoſe. It is much more proper for acute, than chronic diſeaſes; becauſe it is a gentle reſolvent, and promotes both ſweat and urine.

ASPARAGUS, *Aſparagus*, corruptly called *Sparrow graſs*, has a great number of roots, proceeding from a ſingle head, that are round, fleſhy, whitiſh, ſweetiſh, and clammy. Early in the ſpring they emit tender, long, round, green ſhoots, without leaves, that are ſo well known they need no deſcription. When they are grown up they ariſe to the height of two cubits, and are divided into ſlender ſtrong branches, with green, capillaceous, ſoft leaves, an inch in length. The flowers are roſaceous, with ſix petals of a pale green colour, and a piſtil that turns to a ſoft berry of the ſize of a pea, that is globous, purpliſh, ſoft, ſweetiſh, and contains two or three umbilicated black ſeeds. It is cultivated in gardens for the uſe of the kitchen. Aſparagus provokes the appetite, but yields little nouriſhment, and gives the urine a particular ſtrong ſmell. It has little or no medicinal virtues.

ATRIPLEX FŒTIDA, *Stinking Orach*, or *Arrach*, has a ſlender fibrous root, from whence generally proceed branched ſtalks, about nine inches in length, with roundiſh ſmall leaves, terminating in a point, and are covered over with a mealy whitiſh powder. The flowers grow on the top of the ſtalks, and are without petals; for they conſiſt of many ſtamina, ariſing from a calyx divided into five parts, with a piſtil that turns into a ſingle, ſmall ſhining, blackiſh, and roundiſh flat ſeed in a capſula, in the form of a ſtar. It grows in uncultivated places, and near the ſides of roads. It is antihyſterick, and the infuſion of the leaves taken hot is an excellent medicine againſt the hyſterick paſſion.

AURANTIA MALUS, the *Orange-tree*, is not very tall, but has a thick, woody, branched root, which ſpreads very much, and is of a yellow colour on the inſide. The trunk is hard, whitiſh within, has an agreeable ſmell, and is covered with a greeniſh, ſmooth, white bark. The branches are numerous, flexible, and of a beautiful green, with a few thorns thereon. The leaves are ſomewhat like broad leaved laurel, and are always green, thick, ſmooth, broad, and ending at each end in a point, with a foliated pedicle in the ſhape of a heart. When held up to the light there appears to be a ſort of holes in them like St. John's wort. The flowers grow in bunches, and are roſaceous, conſiſting of five white petals placed in a ring, with many ſtamina, which have yellow apices, or heads; at the bottom and center of the cup there is an orbicular placenta, which ſuſtains a roundiſh piſtil with a long tube, that runs into a globous fruit, covered with a rind, which is very well known. There are ſeveral kinds of Oranges, as the *common Seville Orange*, the *ſweet Seville Orange*, the *China Orange*, the *curled leaved Orange*, the *ſtriped curled leaved Orange*, the *horned Orange*, *the common ſtriped Orange*, the *Hermaphrodite Orange*, the *willow leaved Orange*, commonly called the *Turkey Orange*, the *ſtriped Turkey Orange*, the *Pumple Noſe*, or *Shaddock Orange*, the *double flowered Orange*, the *common Dwarf*, or *nutmeg Orange*, the *dwarf ſtriped Orange*, the *dwarf China Orange*, the *childing Orange*, the *diſtorted Orange*, the *large warted Orange*, the *ſtarry Orange*, and the *Orange with a ſweet rind*. Many ſorts of theſe oranges are cultivated in England, though more for curioſity than the fruit they produce; and of late years ſome of them have been planted againſt walls, with frames of glaſs to cover them in the winter. Some curious perſons have likewiſe planted them in the

the open ground, and have had covers for them, which have been taken away in the ſummer; by this means the fruit has ripened ſo well as to be extremely good for eating. However, in hard winters it is very difficult to preſerve them.

Orange peel is an excellent bitter, eſpecially that of Seville oranges, which ſtrengthens the ſtomach, helps digeſtion, attenuates groſs humours, diſcuſſes wind, and eaſes cholic pains proceeding therefrom. It is an ingredient in tinctures, called ſtomachic bitters, and is now common in taverns, where they mix it with a glaſs of wine, and drink it before dinner to create an appetite. The eſſential oil diſtilled from the rind is alſo proper for the ſame uſes, when two or three drops are taken upon ſugar, as well as the peel, when it is candied. The pulp of ſweet oranges is cooling, quenches thirſt, and excites the appetite; but the juice of four oranges not only ſerves to make a cooling drink in hot weather, but is of late found to be excellent againſt the ſcurvy.

BARDANA, *Burdock*, has a thick, ſingle, ſtrait root, a foot in length, blackiſh on the outſide, white within, and of a ſweetiſh ſubauſtere taſte. The leaves are large, being a foot long and upwards; they are ſharpiſh at the points, hairy, and of a dark green colour, but hairy underneath. The flowers conſiſt of many purple florets, deeply cut into five ſegments, reſting on the embryo, which is contained in a cup made of many ſcales, that terminate in hooks, and bend inward. The embryo turns into an oblong, flat, ſtreaked, flattiſh ſeed, with ſhort down or rather tufts of hair. It is to be met with every where by the way ſides. The root is dieuretic, ſudoriſic, pectoral, uterine, vulnerary, and febrifuge. It has been of late greatly recommended in the gout. It is given to a drachm in powder, and to an ounce in decoction. The ſeeds of burdock are of a bitter ſubacrid taſte, and are a powerful diuretic, when a drachm of them is taken in white wine, or any other proper vehicle.

BECCABUNGA, *Brook-lime*, has fibrous, white, creeping roots, with upright ſtalks, that are round, ſpongy, reddiſh, and branched. The leaves are roundiſh, ſmooth, thick, crenated, of a dark green colour, and above an inch in length. The flowers proceed from the places where they join to the leaves, and are placed on ſpikes, a palm, or a palm and a half, in length; they are monopetalous, but divided into four ſegments, and are of a bright blue colour. There are three blue apices, and a piſtil that turns into a membranaceous flat fruit, of the ſhape of a heart, and a quarter of an inch long. It is divided into two cells, containing many ſmall flat ſeeds. This herb has no remarkable taſte, and yet ſome prefer it to other more acrid antiſcorbutics. The doſe of the juice is four ounces; but it is beſt mixed with the juice of oranges, and then it may have a very good effect in hot ſcurvies.

BELLA DONNA, *Deadly Night-Shade*, has a thick, long, juicy, whitiſh root, divided into ſeveral branches; the ſtalks are two cubits high, and are round, as thick as one's thumb, branched, hairy, and of a reddiſh black. The leaves are like thoſe of garden night-ſhade, which are twice or thrice as large, and are ſoft and ſomewhat hairy. From the place where the leaves join to the ſtalks the flowers proceed, which are monopetalous, in the ſhape of a bell, divided into five ſegments, ſtreaked, a little hairy, and of a dark purpliſh black, with five ſtamina, and as many whitiſh apices. From the calyx it is hairy, and divided into five parts; the piſtil proceeds, which is fixed into the hinder part of the flower, like a nail, and turns into a ſoft round fruit, like a grape, of a ſhining black colour, and full of a vinous juice. It is divided by a partition in the middle into two cells, full of many minute oval ſeeds. It grows in woods, near walls and hedges, and in other uncultivated places. The fruit, or berries, have often proved of dangerous conſequence to children who have eat them. They produce a delirium, laughter, various geſticulations, and at laſt madneſs.

BELLIS MAJOR, *the greater*, or *Ox-eye Daiſey*, has a fibrous creeping root, with ſtalks two cubits high, that are erect, of a pentagon ſhape, villous, and branched, with flat leaves placed alternately, two inches long, half an inch broad, and crenated. The flowers are large, radiated, and their diſk conſiſts of many gold coloured florets, divided into five ſegments, with a ſtyle in the middle of each; but the crown is compoſed of white ſemi-florets, reſting upon embryos, and placed in a hemiſpherical ſcaly blackiſh cup. The embryoes at length turn into ſlender, oblong, ſtreaked, naked ſeeds. The heads, after the petals are fallen off, reſemble obtuſe combs.

BELLIS MINOR, *the common Daiſey*, has many ſmall roots, with a great number of leaves lying on the ground, that are flat, hairy, long, and narrow towards the root, ſenſibly increaſing to the end, where they are roundiſh, and they are ſlightly ſerrated. It has no ſtalk, but there are many pedicles between the leaves, a palm or upwards in length, which are ſlender, round, hairy, and on the top of each there is a flower, whoſe diſk is compoſed of many yellow florets, and the crown of ſemi-florets, of a white colour with a reddiſh caſt. The embryoes are placed in a ſingle cup divided into many parts. The embryoes afterwards turn to ſmall naked ſeeds: it is every where common in meadow or paſture lands. Beſides theſe there are the *ſmall ſtriped Daiſey*, the *red garden Daiſey, with double flowers*, the *white double garden Daiſey*, the *double ſtriped garden Daiſey*, the *hen and chicken Daiſey*, the *white cock's comb Daiſey*, and the *red cock's-comb Daiſey*. The garden Daiſeys are propagated by parting the roots in autumn, and ſhould be planted in gardens of ſtrong earth, and be expoſed to the eaſt, for the great heats of ſummer will ſometimes kill them. The leaves of the ox-eye daiſey gathered before the flowers appear, yield a decoction of an acrid taſte, not much unlike pepper. It is commended in purulent ſpitting. The leſſer daiſey has been generally accounted good for internal wounds, and for diſſolving and diſcuſſing grumous blood.

BERBERIS, *the Barberry-tree*, is a tall ſhrub, having fibrous, yellowiſh, creeping roots, and the branches are beſet with ſharp thorns. The leaves are ſmall, oblong, narrow at the bottom, but broader towards the top, are crenated on the edges, and beſet with ſhort thorns. They are ſmooth, green, and have an acrid taſte. The flowers conſiſt of ſix leaves, that expand in the form of a roſe, conſiſting of ſix petals of a yellow colour, with as many ſtamina, and a greeniſh piſtil, turning into a cylindrick red ſoft fruit, one third of an inch in length, and full of an acrid juice, containing one or two oblong kernels. The fruit grows in cluſters hanging down, and the bark of the tree is whitiſh. The beſt method of planting them is to place them eight or ten feet aſunder, keeping their middles thin and free from dead wood. The branches ſhould ſeldom be ſhortened, but when it is done it muſt be at Michaelmas, when the leaves begin to decay. The fruit is cooling and aſtringent, and proper to ſtrengthen the ſtomach and inteſtines, as well as to excite the appetite. The doſe of the expreſſed fruit is an ounce, though they are eaten commonly when ripe. The juice, or decoction, abates the inflammation of the fauces and tonſils, and heals looſe rotten gums. Dyers make uſe of the bark for colouring yellow.

BERULA, *ſive* SIUM, *Water Parſnip*, has geniculated, creeping, white, fibrous roots, from whence proceed ſtalks above a cubit in height, which are

hollow, round, ſtrait, branched, and have many leaves that are ſet thereon by pairs, with a ſingle leaf at the end; they are fat, ſmooth, and cut all round the edges like a ſaw. The flowers are diſpoſed in umbels, and placed at the end of the ſtalk; they are roſaceous, and conſiſt of five white petals placed in a ring. The flower cup turns to a roundiſh fruit, containing two ſmall ſtreaked and gibbous ſeeds. It delights in being in and near rivulets and ditches. It is accounted an antiſcorbutic and aperient, and is thought to open obſtructions. Three ounces of the juice is a doſe; however, it is ſeldom uſed in phyſic, but in ſome countries is eaten as a ſallad.

BETA, *white and red Beets.* The *white Beet* has a round, woody, long, white root, about as thick as one's little finger, with large, broad, ſmooth, thick, ſucculent leaves, ſometimes of a pale, and ſometimes of a deeper green, with a thick broad rib. The ſtalks are ſlender, ſtreaked, branched, and two cubits high. The flowers proceed from the hollow between the ſtalk and the pedicle of the leaf, of which there is a long row; and they have no viſible leaves, but conſiſt of many ſtamina, or threads, which are collected into a globe; the cup of the flower is divided into five ſegments, which turns into a globous fruit, containing two or three ſmall oblong ſeeds of a reddiſh colour.

Red Beet has a white root, and ſhorter leaves than the former, more or leſs red, and ſometimes of a blackiſh red. This is diſtinguiſhed from the former by the number of the leaves.

The *Turnip rooted red Beet* has a higher ſtalk than the common red beet, and the root is two or three inches thick, bellying out; on the outſide it is of a deep blood colour. All theſe beets are cultivated in gardens for the uſe of the kitchen; but they were in greater eſteem formerly than they are at preſent. However, the red beet is ſtill uſed to garniſh diſhes.

BETONICA, *Betony*, has a thick, tranſverſe, fibrous, hairy root, from whence proceed quadrangular knotty ſtalks, growing to the height of a cubit. Some of the leaves proceed from the knots by pairs, placed over againſt each other, and others lie on the ground; they are oblong, villous, wrinkled, and of a darkiſh green colour, and are crenated on the edges. The flowers grow in ſpikes, and are monopetalous, labiated, and of a purpliſh colour; the upper lip is ſulcated, and as it were reclines backwards; but the lower conſiſts of three lobes, with ſtamina of the ſame colour as the former. The flower cup is cut into five ſegments, from whence proceeds a piſtil fixed in the hinder part of the flower, like a nail, with four embryoes, that change to as many roundiſh ſeeds, contained in a capſula, that was the cup of the flower. It is common in woods and ſhady places throughout England. *Betony* is diſcutient and aperient, and has been always accounted an excellent medicine for the head, and the leaves reduced to powder promote ſneezing; for which reaſon, and for its being a cephalick, it is always an ingredient in the herb ſnuffs.

BISTORTA, *Biſtort*, or *Snake-weed*, has a thick, oblong, geniculated root, in ſhape like a finger when it is cloſe bent, and has many hairy fibres. It is of a blackiſh brown without, and of a reddiſh colour within. The leaves are oblong, broad, and acuminated like thoſe of the dock, but leſs; they are full of veins, and of a blackiſh green colour above, but bluiſh below; the ſtalks are about a foot in height, and are ſlender, ſmooth, round, geniculated, and beſet with a few ſmaller leaves; for the largeſt grow at the bottom. The flowers grow like a ſpike at the end of the ſtalk, and are without petals; for they conſiſt of many ſtamina, with fleſh coloured apices or heads. The cup is divided into five ſegments, and the piſtil turns to a triangular reddiſh black ſhining ſeed, contained in a capſula, that was the cup of the flower. The root is only in uſe. It is ſaid to be balſamic, vulnerary, and aſtringent, and is uſed in all caſes where aſtringency is proper, particularly in hæmorrhages, ſpitting of blood, and overflowing of the menſes. The decoction of half an ounce to an ounce of the freſh root is a doſe, or rather it may be taken at ſeveral times; and the powder may be given from half a drachm to a drachm, made into a bolus with conſerve of roſes.

BONUS HENRICUS, *the Engliſh herb Mercury*, has a thick yellowiſh root, furniſhed with a few fibres, from whence proceed concave ſtalks, to the height of a cubit, which are a little hairy; the leaves are triangular, ſmooth above, but below ſprinkled with a ſort of meal, and they have long pedicles placed on the ſtalks alternately. The flowers, that grow in ſeveral bunches on the top of the ſtalks, are ſmall and without petals, but they have ſeveral yellow ſtamina proceeding from the flower cup, which is divided into many ſegments. The piſtil turns into a ſmall ſeed, in the ſhape of a kidney, which is black when ripe. It grows in uncultivated places by the way ſide, and among the ruins of old walls and buildings. It is often uſed for food in many parts of England, and is reckoned as good as ſpinage. It is emollient, and has been ſometimes uſed as a cataplaſm to appeaſe the pains of the gout, and that without any danger.

BORRAGO, *Burrage*, has a white, thick, fibrous root, and broad, roundiſh, rough, wrinkled, blackiſh green leaves, that lie on the ground; but thoſe that are higher are furniſhed with exceeding ſmall prickles. The ſtalk is hairy, round, hollow, branched, and grows to the height of a cubit. The flowers, that grow on the top of the branches, are of a fine blue, placed on pedicles, an inch in length, that are crooked and bend downwards. The flowers have only a ſingle petal, which is deeply divided into five ſegments, ſharp at the ends, and placed like a ſtar; the apices in the middle of the flower are ſharp pointed, and adhere together in the ſhape of a pyramid. The flower cup is green, hairy, and divided into five acuminated ſegments, from which a piſtil ariſes, fixed in the hinder part of the flower, like a nail; and there are four embryoes, that turn into as many ſeeds in the ſhape of a viper's head. It is common in all parts of England, and is often found in dunghills and on public roads. The ſeeds of this plant may be ſown in the ſpring or autumn, ſoon after they are ripe; it will grow almoſt in any ſoil, but that which is dry is beſt. It is often uſed in the ſummer time with balm for making cool tankards, and the flowers are ſaid to be cordial, and to have many other virtues, as well as the herb, that are now diſallowed.

BRASSICÆ, *Cabbages*, are of ſeveral ſorts, as the *common white Cabbage*, the *Ruſſian Cabbage*, the *red Cabbage*, the *flat ſided Cabbage*, the *ſugar loafed Cabbage*, the *early Batterſea Cabbage*, the *white Savoy Cabbage*, the *green Savoy Cabbage*, the *green Broccoli*, the *Italian Broccoli*, the *turnip Cabbage*, *curled Colewort*, the *muſt Cabbage*, the *branching tree Cabbage from the ſea coaſt*, *brown Broccoli*, *common Colewort*, the *Cauliflower*, the *Borecole*, *Alpine Colewort*, *perfoliated wild Cabbage*, *white Cabbage with a white flower*, and the *perfoliated wild Cabbage with a purple flower*.

BRASSICA CAPITATA ALBA, the *common white Cabbage*, is very well known, and bears, like all the reſt, flowers that conſiſt of four leaves or petals, in the form of a croſs, which are of a yellow, or pale yellow colour, placed in a cup divided into four ſegments, from which ariſes a piſtil that turns into a round, long, ſlender fruit, or pod, divided by a partition in the middle, and conſiſting of two cells, full of roundiſh blackiſh ſeeds.

BRASSICA CAPITATA RUBRA, the *red Cabbage*,

bage, has leaves like the common cabbage, but the colour is various, for ſometimes they are of a blackiſh purple, ſometimes of a greeniſh black, and at other times more greeniſh; but they have all red ribs and nerves.

BRASSICA RUBRA VULGARIS, the *common red Cabbage*, is taller than the former, and has a ſtalk that grows ſometimes to the height of two yards, which is thick, of a blackiſh purple colour, and watry on the lower part. The leaves are irregularly placed, and are all of a greeniſh red, with ſome ſhades of blue, and wrinkled, with thick veins. The flowers that grow on the top of the ſtalks are yellow, and change into pods a palm in length, that contain red round ſeeds. The leaves are not collected into heads as the former, but continue expanded and open. It ſtands the winter very well, and continues ſeveral years. The ends of the branches in the ſpring are eaten as a ſallad.

BRASSICA ALBA CRISPA, the *white Savoy Cabbage*, has round extremely wrinkled leaves, which ſeem to be divided into cells, and have ſhort pedicles. They are collected into a ſmall whitiſh head; but their extremities are of a dark green. The flowers and ſeeds are like the former.

BRASSICA CAULI FLORA, the *Cauliflower*, has large leaves, upwards of half a yard in length, which are ſharper than thoſe of the common cabbage, but not ſo broad; they are of a light green with a bluiſh caſt, and the nerves on the outſides are whitiſh. The leaves are collected into a head, but not ſo cloſe as a cabbage, between which there is a heap of thick whitiſh ſoft flowers, that are generally in great eſteem. When they are not gathered for the kitchen, they ariſe to a conſiderable height in time, and turn from flowers to pods like the former. Theſe are all the ſorts mentioned by medicinal writers, for the reſt are only for the kitchen.

The common white, red, and long-ſided Cabbages, are chiefly cultivated for winter uſe, and the ſeeds muſt be ſown at the end of March in beds of good freſh earth. Towards the end of April, when the young plants have about eight leaves, they ſhould be pricked out into ſhady borders, about three inches ſquare, to prevent their being long ſhanked. They ſhould be tranſplanted in the latter end of May to the place where they are to grow, and ſhould be ſet in rows, two feet and a half diſtant. If the ſeaſon ſhould prove dry when they are tranſplanted, they muſt be watered every other evening, till they have taken freſh root. As they advance in height, the earth muſt be drawn about the ſtems with a hoe, which will greatly ſtrengthen the plants. Some of theſe cabbages will be fit for uſe ſoon after Michaelmas, and the reſt will continue till the beginning of March, if not deſtroyed by bad weather: to prevent which the gardeners near London pull up their cabbages in November, and trench their ground up in ridges, laying their cabbages againſt the ridges as cloſe as poſſible on one ſide, and bury their ſtems in the ground. They are ſuffered to remain in this manner till after Chriſtmas, when they cut them for the market.

The Batterſea, and ſugar loaf Cabbages, are for ſummere uſe, and are uſually named Michaelmas cabbages. The ſeeds are to be ſown in the beginning of Auguſt, in an open ſpot of ground, and when they have eight leaves they muſt be pricked into beds at three inches diſtant every way. Towards the end of October they muſt be planted out for good, two feet and a half diſtant from each other, and the rows muſt be three feet aſunder. In the ſpring the earth muſt be drawn up about the ſtem with a hoe, and in May their leaves will begin to cabbage, to promote which they may be tied together with a ſlender oſier twig.

The Savoy Cabbages are propagated for winter uſe; for a froſt is thought to make them better. They muſt be ſown about the middle of April, and cultivated in the ſame manner as common white cabbage, but ſomewhat nearer to each other.

The BRASSICA FIMBRIATA, that is, *the Boorcole*, may be treated in the ſame manner, but need not be planted above a foot ſquare. Theſe are never eaten till the froſt has rendered them tender; for otherwiſe they are tough and bitter. The ſeeds of the ſeveral kinds of broccoli ſhould be ſown the latter end of May or beginning of June, and when the plants have eight leaves they ſhould be tranſplanted into beds, like the common cabbage; and at the end of July they will be fit to plant out for good, which ſhould be in a ſheltered ſpot of ground, but not under trees, and about a foot and a half diſtant each way. Towards the middle of December they will begin to ſhow their ſmall heads, which are ſomewhat like a cauliflower, but of a purple colour; and they will continue to be fit to eat till the beginning of April. The brown ſort ſhould be ſown in April, and be managed like the common cabbage.

The Turnip cabbage is not ſo much cultivated as formerly, though ſome yet eſteem them for ſoups. The ſeeds muſt be ſown on a bed of light freſh earth, and when the plants are about an inch high, they ſhould be removed to a ſhady border, and ſet at about two inches diſtant every way, watering them till they have taken root. Near the middle of June they ſhould be tranſplanted out where they are to remain, and ſet at two feet diſtance every way, watering them till they have taken root; the earth ſhould be drawn about them with a hoe, to prevent them from drying, and in the winter they will be fit for uſe.

The ſeeds of the curled colewort may be ſown in the middle of July, and when they are ſtrong enough for tranſplanting, they ſhould be ſet in rows, nine inches aſunder, and at five inches diſtance in the rows, in a moiſt ſeaſon. They will be fit for uſe after Chriſtmas, and continue good till April.

BRYONIA ALBA, *white Bryony*, or *Wild Vine*, has a root ſometimes as thick as a man's thigh, is fleſhy, and divided into large branches; when it is dried it is ſpongy, and marked with circles and rays. The taſte is acrid, bitteriſh, and diſagreeable, and the ſmell while freſh is very ſtrong. The ſtalks are long, ſlender, ſtreaked, a little hairy, and climbing with tendrils like a vine. The leaves are angular, ſet alternately on the ſtalks, and are ſhaped pretty much like thoſe of a vine, only they are leſs, and a little rough. The flowers proceed from the hollows where the leaves join to the ſtalk, and conſiſt of a ſingle petal, which is open in the ſhape of a bell, and divided into five parts, of a whitiſh green colour, marked with veins. Some of theſe flowers are large, and without embryoes; others are leſs, and contain one embryo, which turns into a ſpherical berry of the ſize of a pea; it is at firſt green, then red and full of a nauſeous juice, as well as round ſeeds, covered with ſlime. It may be cultivated in gardens by ſowing the berries in the ſpring of the year in a dry poor ſoil, where they will in two years time grow to be large roots. It grows wild under hedges, and climbs upon the buſhes. The juice of the root is ſo ſharp that it eats into the ſkin; however, when they are dry, they loſe a great part of their acrimony; it is a ſtrong cathartic, and we have ſome notable inſtances of its killing and bringing away worms; it has been uſed in madneſs, and ſome kinds of dropſies with ſucceſs, as well as in a moiſt aſthma. The dried root reduced to powder, is given from a ſcruple to a drachm; but the extract made by water is much the beſt and ſafeſt, becauſe it works in a milder manner, and the doſe is from half a drachm to to a drachm. Externally, it is a powerful reſolvent, and has been recommended againſt pains in the

ſide, the hip-gout, and ſcrophulous tumours. The freſh root being bruiſed, and laid to the ſmall of the back, has promoted urine and cured the dropſy; likewiſe, when it has been graſped in the hand when freſh for ſome time, it has been known to purge. For the hip-gout it ſhould be bruiſed, mixed with linſeed oil, and laid warm to the part.

BRYONIA NIGRA VULGARIS *ſeu* RACEMOSA, *black Bryony*, has a large, thick, long, tuberoſe root, black on the outſide, but white within, and full of a thick ſizy juice, with no diſagreeable taſte. The ſtalks are like thoſe of the vine, but without tendrils; however, they are ſlender, long, climbing, woody, and of a dark reddiſh colour, with ſoft, green, ſhining leaves, placed alternately thereon, like thoſe of the great bind-weed. The flowers proceed from the hollows between the leaves and the ſtalks, and grow in bunches; they conſiſt of a ſingle petal in the ſhape of a bell, and are divided into ſix ſegments of a yellowiſh green colour, ſome of which are barren, and others fruitful. Theſe laſt ſort have an embryo, which turns to an oval red berry, or of a browniſh red, full of roundiſh ſeeds. Its common uſe is as a reſolvent; for it will take off the black and blue marks of the ſkin ariſing from bruiſes, when it is bruiſed and laid thereto in the form of a cataplaſm.

BUGLOSSUM, *garden Bugloſs*, has a long round root, about as thick as one's finger, which is reddiſh or blackiſh without, but white within, and abounding with a clammy juice. The ſtalks riſe to above a cubit in height, which are round and beſet with ſtiff hairs. The upper part is branched, and has leaves ſet thereon without pedicles; they are narrow, oblong, of a bluiſh green, and terminate in a ſharp point, but are not wrinkled like burrage. They are hairy on both ſides, and their edges are even. The flowers grow at the top of the ſtalks and branches, and are in the ſhape of a funnel, conſiſting only of a ſingle petal. The flower cup is compoſed of five oblong, narrow, ſharp, hairy ſegments, and the flower conſiſts of the ſame number, and is of a bluiſh purple colour. The piſtil is oblong, and fixed in the hinder part of the flower like a nail; there are four embryoes, which turn to as many ſeeds in the ſhape of vipers heads. The tops of the ſtalks and the cups of the flowers are purple. It is cultivated in gardens. The flowers are in the number of thoſe that are ſaid to be cordial, and are proper to reſtrain the heat of the blood, as well as to promote its circulation, according to ſome. The flowers may be uſed in the ſame manner as tea.

BUGULA, *Bugle*, or *middle Conſound*, has a ſlender, fibrous, white root, with roundiſh, ſoft, ſinuated leaves, of a dark greeniſh colour, and two inches in length. It grows in ſtony places; the lower part is generally purpliſh, and the taſte at firſt is ſweetiſh, but afterwards bitteriſh and aſtringent. Some of the ſtalks are ſlender, roundiſh, and creep on the ground, while others riſe to the height of a palm, and are quadrangular, with hair on two of the oppoſite ſides. The flowers are placed in whirls round the ſtalks, and conſiſt of a ſingle petal, one of whoſe lips is divided into three parts, the middlemoſt of which is ſplit in two. The place of the under lip is ſupplied by ſmall teeth, with a piſtil and blue apices like the flower. The flower cup is ſhort, hairy, and divided into five ſegments, from whence the piſtil riſes, and is fixed in the hinder part of the flower like a nail. It is attended with four embryoes, that turn to as many roundiſh ſeeds ſhut up in a huſk, which before was the flower cup. It delights in meadows and ſhady places. It is a vulnerary herb, and is good in all caſes where mild aſtringents are proper.

BURSA PASTORIS, *Shepherd's-Pouch*, has a white, ſtrait, fibrous, ſlender root, with a ſtalk that riſes to a cubit in height. The lower leaves are ſometimes whole, but more generally jagged like dandelion; but thoſe that grow on the ſtalks are much leſs broad at the baſe, with even edges, and terminate in a point. The flowers are placed in rows on the tops of the branches, are ſmall, and in the form of a croſs; they conſiſt of four roundiſh petals with ſmall ſtamina, bearing yellow apices or heads. The flower cup conſiſts of four leaves, and the piſtil turns into a flat fruit in the ſhape of a heart, or as ſome fancy like a purſe, and is a quarter of an inch long; it is divided into two cells, in which are contained exceeding ſmall ſeeds. It is ſaid to be a vulnerary, aſtringent, cooling herb, and is given in all hæmorrhages and fluxes; but ſome think it is ſo binding as not to be ſafe.

BUXUS, the *Box-tree*, is a ſhrub which ſeldom grows to any conſiderable ſize in England, though it has ſometimes been ſeen as thick as a man's thigh. The largeſt were found in great plenty upon Box-hill, near Darking in Surry; but of late they have been pretty much deſtroyed; however, there are many ſtill remaining, of a conſiderable bigneſs. Some have thought that the box wood, made uſe of by mathematical inſtrument makers and others, was the product of England; but this is a miſtake, for it is brought from the Levant in large blocks. This ſhrub is an ever-green, and very buſhy, having oblong, ſmall, hard, thick, ſhining leaves, of a diſagreeable bitteriſh ſmell and taſte. The flowers are of two ſorts, the barren and the fruitful: the firſt are without petals, and conſiſt of many ſtamina, generally proceeding from the bottom of a foliated ſquare flower cup, of a yellowiſh colour; the fruitful, or rather the fruit, is ſhaped like a pottage-pot turned upſide down, and is divided into three cells of a green colour, containing two ſeeds, each of which when ripe is thrown out by the elaſticity of the veſſels; the ſeeds are brown, long, and ſhining. Theſe ſhrubs are a very great ornament to cold and barren ſoils, where few other things will grow. They may be propagated by planting the cuttings in a ſhady border, obſerving to keep them watered till they have taken root. The beſt ſeaſon for tranſplanting theſe into nurſeries is in October; or the ſeeds may be ſown ſoon after they are ripe in a ſhady border, which muſt be duly watered in dry weather; and from theſe you may expect the largeſt trees.

There are ſeveral ſorts of Box-trees, as the *common Box-tree*, the *narrow leaved*, the *ſtriped*, the *gold edged*, the *ſilver headed*, the *dwarf*, and the *dwarf ſtriped Box*. The dwarf kind is uſed for bordering flower-beds, for which purpoſe it is excellent, as it will bear all weathers, and is kept handſome with little trouble. This is eaſily propagated by parting the roots, which is much better than planting the ſlips. It is ſeldom uſed in medicine.

CALAMINTHA, *common Calamint*, has a fibrous root, with ſtalks growing to the height of a palm and upwards, which are quadrangular, branched, and have leaves growing by pairs oppoſite to each other. They are from half an inch to an inch in length, and are roundiſh, obtuſely acuminated, a little ſerrated and hairy, with an acrid taſte, and a diſagreeable ſmell. From the middle to the top, the flowers grow where the pedicle of the leaves join to the ſtalk in bunches; they are long and tubulous, and open at the top with two lips; the uppermoſt of which, or creſt, is roundiſh, and divided into two ſegments; but the lowermoſt, or beard, is divided into three. They are of a purpliſh colour, and placed in a hairy ſtreaked calyx, from whence riſes a piſtil fixed in the hinder part of the flower like a nail, and as it were attended with four embryoes, which turn into as many light

blackiſh ſeeds, whoſe calyx was the capſula of the flower.

Calamint (of which there are ſeveral ſorts, but they differ ſo little from that already deſcribed, as to require no particular deſcription) powerfully incides groſs humours, excites the appetite, and diſcuſſes wind. It is taken in the manner of tea, and is generally accounted a good hyſteric.

CALENDULA, *garden Marygold*, is otherwiſe called *Caltha Vulgaris*, and has a root divided into many thick fibres or branches; but the ſtalks are ſlender, a little angular, hairy, and clammy to the touch. It is divided into many branches, and the leaves are narrower at the baſe than at the top; they are hairy, and of a light green colour. The flowers grow on the top of the branches, and are of a gold colour and radiated; the diſk conſiſts of many tubulous florets, divided into five parts; and the crown is compoſed of crenated ſemi-florets, placed upon embryoes in a hairy flower cup, divided into many parts. The embryoes turn into crooked marginated capſulæ full of oblong ſeeds. It is cultivated in gardens, and if the ſeeds are permitted to ſcatter, they will multiply greatly, and become as troubleſome as weeds. The flowers are ſaid to be aperient and diſſolvent, and proper to open obſtructions of the liver, ſpleen, and womb; but they are not very efficacious for theſe purpoſes; however, infuſed in wine, they will open a ſlight obſtruction of the liver.

CAMPHORATA, *ſtinking ground Pink*, has a long woody root, about the thickneſs of a man's thumb, with many woody, thickiſh, branched, hairy, whitiſh ſtalks, with ſmall knots placed alternately, from whence proceed a great many leaves, not a third of an inch in length, which are thin, hairy, pretty thick, have an aromatic ſmell, and when rubbed between the fingers ſmell pretty much like camphire. The flowers are without petals; for they conſiſt of four ſtamina, with roſe coloured apices, or heads, proceeding from a cup, which is only a ſingle herbaceous leaf, divided into three, and ſometimes into five, ſegments; from whence ariſes a piſtil, that turns into a ſmall, oblong, black, roundiſh ſeed, contained in a capſula, which was the calyx of the flower. It promotes urine and ſweat, and is good in recent obſtructions of the viſcera, as well as in the moiſt dropſy. It may be drank as tea, but is very heating, and therefore muſt be uſed cautiouſly.

CANNABIS SATIVA, *manured Hemp*, has a ſingle, white, woody, fibrous root, with a ſquare hairy ſtalk, rough to the touch, and hollow within; it grows two yards high, and has a rind that may be divided into threads. The leaves conſiſt of five ſegments or upwards, which are narrow and divided to the very pedicle; they are oblong, acuminated, ſerrated, veinous, rough, of a blackiſh green colour, and of a ſtrong ſmell. The flowers and fruit do not grow upon the ſame plant; the former proceed from the places where the leaves join to the ſtalk, and have no viſible petals; they conſiſt of five ſtamina with yellow apices or heads, placed in a cup compoſed of five leaves, purpliſh without, and whitiſh within. The fruit on other ſtalks are without flowers; but they have piſtils contained in a membranaceous capſula of a yellowiſh green colour, which turn into a roundiſh ſmooth ſeed, covered with a thin ſhining ſhell. The plants of both kinds proceed from the ſame ſeeds, which are ſown in almoſt all parts of the world. The uſe of hemp is every where well known, it being made into ropes, thread, linen, and paper.

Hemp is always ſown in a deep, moiſt, rich ſoil, ſuch as is found in Holland, in Lincolnſhire, and the fens of the Iſle of Ely, where it is cultivated to great advantage. The land ſhould be well ploughed and rendered fine by the harrow; the latter end of April is the beſt time of ſowing the ſeed, of which the heavieſt and brighteſt coloured is beſt; when the plants come up, they ſhould be hoed up like turnips, leaving them a foot or ſixteen inches aſunder; about a month after they ſhould be hoed again, to deſtroy the leaves. The firſt ſeaſon of pulling the hemp is about the latter end of Auguſt, and they firſt begin with the *ſimble hemp*, which is the male plant; but a fortnight or three weeks longer would be better, that none of the ſeeds may prove abortive. The ſecond pulling is about the middle of October, when the ſeeds are ripe, and this is uſually called *karl-hemp*, they being the female plants.

Hemp ſeed is recommended by Sir John Floyer, and others, againſt the jaundice, for which purpoſe two ounces may be boiled in a quart of milk till they break; and five or ſix ounces of this decoction may be taken ſeveral times in a day. It is alſo good in coughs, and heat of urine. The oil expreſſed from the ſeeds is recommended by ſome to eaſe the pain proceeding from burns.

CAPPARIS, *the Caper-buſh*, has a large woody root, from whence proceed various ſhoots, armed with hard ſharp prickles, and on which the leaves are alternately diſpoſed, which are almoſt round, half an inch broad, and very bitter. The flowers proceed from the hollows where the leaves join to the ſtalks, and are roſaceous, white, and conſiſt of four petals; from whoſe middle ariſes many ſtamina, with a long piſtil; the flower cup conſiſts of four green leaves, and the extreme part turns into a fruit almoſt in the ſhape of a pear; they are of the ſize of a large olive, and contain many ſmall whitiſh ſeeds, almoſt in the ſhape of a kidney. In Italy it grows wild among the ruins of old walls and buildings, but in other places it is cultivated. There are ſeveral ſorts of caper-buſhes, as the *large fruited Caper without thorns*, the *prickly round leaved Caper with a ſmall fruit*, the *ſharp leaved Caper*, the *American tree Caper with a bay leaf, and a long fruit*, the *American tree Caper with a bay leaf and an oval fruit*, the *American tree Caper with laurel leaves and an oblong fruit*. In England it is very difficult to preſerve theſe plants, and therefore nothing need to be ſaid about their cultivation. What we call capers are the buds of the flowers before they are opened, which at firſt are laid in the ſhade for about four hours, and then put into vinegar for eight days; after which they are taken out, lightly preſſed, and put into freſh vinegar for eight days more; this is repeated a third time, and then they are put up into caſks for ſale. They are every where known as a ſauce, and are uſed to excite a languid appetite. Some put them into a braſs veſſel to give them a finer green colour, and then they are noxious. It is not uſed in medicine.

CAPRIFOLIUM, *Woodbind*, or *Honey-ſuckle*, has a woody creeping root with large fibres; the ſtalks are divided into branches, and are creeping or climbing, on which the leaves grow by pairs oppoſite to each other; they are oblong, ſharp, ſoft, of a light green above, and hoary beneath. The flowers grow on the tops of the branches, and in ſome plants are white, and in others red or yellowiſh; they have a very ſweet ſmell, and conſiſt of a ſingle tubulated petal, which grows open towards the top, and is divided into two lips, the uppermoſt of which is again divided into two, and the lowermoſt into many ſegments. The tube of the flower is bent, and ſometimes reſembles a huntſman's horn; they are produced in cluſters, and placed in a cup conſiſting of a ſingle leaf; this turns to a ſoft fruit, or berry, of which ſeveral grow together in bunches, almoſt in the manner of alder-berries. They are red when ripe, and are full of hardiſh, roundiſh, flattiſh ſeeds. It is found growing in the hedges in many parts of England, as well as in our gardens.

CARDIACA, *Mother-wort*, has a root conſiſting of fibres, proceeding from one head, from whence ariſe quadrangular hard ſtalks, two or three feet high, of a reddiſh black colour. The leaves are veinous and wrinkled, and, though ſmooth, are covered on both ſides with down. The lowermoſt are round and of a pale green; but they are divided into three ſegments, dentated about the edges. The higher they are the narrower they grow, and end in a long point, having on each ſide a ſingle tooth. The cups conſiſt of a ſingle leaf, are hard, and divided into five ſtiff ſharp thorns, attended with many others. The flower is labiated, and conſiſt alſo of one ear, whoſe upper lip is imbricated, with pieces laid over each other in the manner of tiles, and is much longer than the lower lip, which is cut into three parts. The piſtil riſes from the flower cup, attended with four embryoes, and is fixed in the hinder part of the flower like a nail; the embryoes turn into as many ſmall, oblong, angular, ſmooth ſeeds, taking up the whole capſula, which was the cup of the flower. It is found wild in England near gardens, from whence it has been thrown out. It is ſaid to cure convulſions, open obſtructions of the viſcera, and to kill worms; ſome account it excellent in diſeaſes of the ſpleen, and the hyſteric paſſion. The doſe of the leaves in powder is a drachm, and muſt be taken in wine.

CARDUUS BENEDICTUS, *the bleſſed Thiſtle*, has a white fibrous root, and leaves laciniated like dandelion, but deeper, hairy, and terminating in ſhort pedicles; they are alternately placed on the ſtalks, which are villous, ſtreaked, and ſuſtain large flowers, conſiſting of florets that are divided into ſegments, five with a piſtil cut into three or five ſmall ſtamina, on which are long apices or heads adhering to each other, and as it were forming a tube. The calyx is ſcaly, in the ſhape of a pear, and armed with branched ſpires, as well as with large leaves in the form of a head, covered with a great deal of down; the leaves are long, ſtreaked, yellowiſh and downy. The whole plant is remarkably bitter, except the root, which is milder. It is reſolvent and ſtrengthening, promotes ſweat, and reſtrains putrefaction. It is good in weakneſſes of the ſtomach, the moiſt aſthma, the hooping cough, the jaundice, and in all cold diſeaſes; but in ſpotted fevers and the plague, it is not ſo good as ſome authors have pretended. It has often cured agues, when uſed ſome time before the fit. In chronical diſeaſes, the infuſion of the tops may be taken ſeveral times a day. The decoction is often uſed to provoke vomiting, when a former emetic has failed. A ſlight infuſion is excellent in the loſs of appetite after hard drinking, and one that is ſtronger will occaſion a plentiful ſweat, and promote all the ſecretions in general. Some give from an ounce to two ounces and upwards of the juice, and a drachm of the ſeeds in emulſions, which laſt, with diſtilled poppy water, has been given with great ſucceſs againſt the pleuriſy and rheumatiſm.

CARDUUS MARIÆ, *Ladies Thiſtle*, has a long, thick, fibrous root, and long, broad, ſinuated leaves, crenated on the edges, with many hard, ſhining, ſmooth, ſtiff prickles, of a light green colour, and variegated with lines or ſtripes of white. The ſtalks are about as thick as one's finger, ſtreaked, covered with a hairy down, are branched, and two or three cubits high. The flowers grow on the heads of the branches, and conſiſt of many purple tubulous florets, divided into five parts at the top, each of which is placed on an embryo in a ſcaly prickly calyx. Each embryo turns into a ſmooth oval ſeed, a little flattiſh, and furniſhed with down. It grows in uncultivated places, and by the way ſides. The tender leaves, after the prickles are taken off, are eaten by ſome as a ſallad, and are ſaid to have the ſame virtues as carduus benedictus. The ſeed is excellent for the pleuriſy, rheumatiſm, and pains of the breaſt; it is given in emulſions from one drachm to two.

CARYOPHILLUS, *Clove July flowers*, or *Carnations*, have a ſingle fibrous root, with many ſmooth ſtalks riſing to a cubit in height; they are geniculated, knotty, and branched, with leaves proceeding from every knee, which are narrow like graſs, pointed at the end, and of a greeniſh blue colour. The flowers grow on the top of each branch, and are of different colours, as is well known to all; they have a ſpicy ſmell like cloves, and the ſtamina and apices are white, with a piſtil terminating in two or three crooked filaments; the flower cup is ſcaly at the bottom, denticulated at the top, and membranaceous. The piſtil turns to a cylindraceous fruit contained in the calyx, and is full of flat rough ſeeds, that are black when ripe. There is a great deal of difference, as well in the ſize and colours of the flowers, as in the number of the petals, which varieties proceed from the difference of their cultivation. They are propagated either from ſeeds or from layers. The ſeeds ought to be well choſen, and ſhould be ſown in pots or boxes about the middle of April, in freſh light earth, mixed with rotten cow-dung, well incorporated together, covering them about a quarter of an inch thick with the ſame earth. Theſe ſhould be placed ſo as to receive the morning ſun only till eleven o'clock, and in a month's time they will come up, and be fit for tranſplantation in the middle of June, into beds of the ſame ſort of earth lying in an open airy ſituation. They ſhould be planted about three inches ſquare, obſerving to water and ſhade them as the ſeaſon ſhall require. They may remain thus till the middle of Auguſt, and then they ſhould be removed to beds of the like earth, ſetting them at ſix inches diſtant every way, and not above four rows in a bed. When the flowers begin to blow, thoſe that do not break their pods ſhould be reſerved to plant in borders, to preſerve the ſeeds; thoſe that burſt their buds, and ſeem to have good properties, ſhould be planted in pots; but you cannot be certain of the value of the flower till the next year. Theſe flowers were formerly greatly eſteemed by phyſicians for their excellent virtues; but they are now of no other uſe with us but to make ſyrup, for which purpoſe the red ſhould be choſen, as they have a pleaſant aromatic ſmell.

CARUUS, *Caraway*, has a ſingle long root, about as thick as one's thumb, with a few fibres, and an acrid aromatic taſte. The ſtalks riſe to the height of a cubit, or a cubit and a half, and are ſmooth, ſtreaked, and branched. The leaves are winged, narrow, conjugated, and cut into ſmall ſegments, of a dark green colour. The flowers are placed in umbels, are ſmall, roſaceous, and conſiſt of five petals, in the ſhape of hearts, placed in a ring, and contained in a green cup, with very ſlender whitiſh ſtamina, and green apices or heads. The calyx turns to a fruit, conſiſting of two ſmall longiſh ſeeds, ſtreaked and gibbous on the one ſide, and on the other plain; they are blackiſh, acrid, and aromatic. It is ſometimes found wild in England in rich moiſt paſtures. There are ſeveral ſorts, as the *common*, the *large ſeeded*, the *narrow leaved*, *with aſphodel roots*, and the *alpine Caraway*. They are all to be ſeen in the gardens of the curious, and are cultivated by ſowing their ſeeds in the ſpring of the year, in a moiſt rich ſoil. They ſhould be hoed out to about ſix inches ſquare, which will greatly ſtrengthen them, and promote their ſeed plentifully. When the ſeeds are ripe, in autumn, the plants ſhould be cut, and laid upon mats to dry, after which their ſeeds may be taken out and kept for uſe. They are ſtomachic and diuretic, and numbered among the four greater

hot ſeeds. They incide groſs humours, diſcuſs wind, appeaſe the cholic, and help digeſtion; but they are bad in very hot conſtitutions and inflammations. The doſe, in powder, is from a ſcruple to a drachm.

CASTANEA, the *Cheſnut-tree*, is large, tall, and full of branches, and ſometimes grows to a large ſize. The wood is ſolid, durable, and not obnoxious to putrefaction; it crackles in the fire, and has ſmooth, ſpotted, blackiſh bark, inclinable to an aſh colour. The leaves are large, being about two inches broad, and four or five long; are thin, rough, wrinkled, and cut on the edges, with many tranſverſe veins on the back, which run from the rib in the middle. The male flowers, or catkins, conſiſt of many ſtamina, which proceed from a green cup, compoſed of five leaves, and have yellow heads. They are fixed to a ſmall capillament or axis, and are barren. The outer coat of the fruit is very rough and prickly, and grows diſtinct from the flowers. In each huſk, or covering, there are two or three kernels or nuts, which are ſometimes an inch in length, and of a roundiſh flat ſhape. This is the tree that is planted, but there is another ſort which grows wild, and differs from the former only in being leſs in every ſenſe. Cheſnuts are of great uſe in many countries, where they eat them inſtead of bread, eſpecially in the mountainous parts of France. Some boil them, and others roaſt them in pans over the fire; but whatever way they are prepared, they are windy and hard of digeſtion; and conſequently ſeldom agree with any, except laborious working people.

CENTAURIUM MAJUS, the *greater Centaury*, has a thick, ſolid, heavy root, three feet in length, and blackiſh without, but reddiſh within, with a ſweetiſh, aſtringent, biting taſte. The ſtalks are round, and riſe to the height of two or three cubits, with many branches; the leaves are large, and divided into ſeveral parts in the form of a wing. The particular leaves, of which they are made up, are near a ſpan in length, and three or four inches broad, not unlike thoſe of walnuts; they are ſmooth, ſerrated on the edges, full of nerves, and of a deep green colour. On the tops of the branches there are ſmall heads or flowers, conſiſting of blue florets, divided into five parts, and placed upon an embryo in a ſcaly cup, but the ſcales are without points. The embryo turns to an oblong, ſmooth ſeed, furniſhed with down, like thoſe of carduus benedictus. It grows wild among the Alps, from whence it is brought to us; but it is cultivated in gardens, and may be propagated either by ſowing the ſeeds, or parting the roots, the latter of which is moſt commonly practiſed in England. The beſt ſeaſons for this work, are October and February.

CENTAURIUM MINUS, *leſſer Centaury*, has a ſmall, white, woody, fibrous root, with a branched angular ſtalk, about a ſpan in height. Some of the leaves lie on the ground, while others are placed on the ſtalk by pairs. The flowers grow in cluſters on the top of the branches, and conſiſt of ſingle petals, in the ſhape of a funnel, and are of a beautiful reddiſh colour. The cup of the flower is compoſed of five ſharp leaves, and a piſtil, fixed in the loweſt part of the flower, which turns to a membranaceous fruit, half an inch long, of a cylindrick ſhape, and full of exceeding ſmall ſeeds. It grows wild upon dry arable land, and chiefly among corn. Both the flowers and leaves are extremely bitter, and the florid tops incide groſs humours, ſtrengthen the ſtomach, help digeſtion, open obſtructions of the viſcera, cure the jaundice, and the ſuppreſſion of the piles. The doſe in powder is to a drachm. Outwardly, it is vulnerary, and cures recent wounds, and old ulcers.

CEPA, the *Onion*, is of ſeveral kinds, but the moſt uſual are, the *common Onion*, the *red Spaniſh Onion*, the *Scallion*, and the *Ciboule*.

CEPA VULGARIS CANDIDA, the *common white Onion*, has a bulbous root, conſiſting of various coats, the outermoſt of which are membranaceous, and the innermoſt fleſhy, with many fibres at the bottom. The leaves are long, fiſtulous, round, and ſharp at the points; the ſtalk is naked, upright, and ſometimes riſes to the height of two or three cubits, eſpecially in hot countries; this is likewiſe hollow, ſwells out in the middle, and the flowers are collected into a ſpherical head; they are compoſed of ſix petals or leaves, in the middle of which are ſix ſtamina, and a piſtil, which turns into a roundiſh fruit, divided into three cells, full of roundiſh black ſeeds. They are propagated by ſeed, which ſhould be ſown in the beginning of March, on good rich ſandy ground, and eight pounds is ſufficient for a whole acre of land. About a month or ſix weeks after ſowing, they will be ready to hoe, which ſhould be done with one two inches and a half broad, cutting out, not only the weeds, but the onions, where they are too thick. This is beſt done in a dry ſeaſon, and ſhould be repeated twice more, cutting out the weeds as before. Towards the beginning of Auguſt, the onions will be at their full growth, which is known by the blades falling to the ground, and ſhrinking; but before they are quite withered, they ſhould be drawn out, cropping off the extreme part of the blade, and then laying them upon a dry ſpot, turning them every other day for a fortnight, leſt they ſhould take root again. The Spaniſh onions are much in eſteem, but will not long preſerve their kind here, without freſh ſeeds from Spain or Portugal. They are chiefly preſerved for the kitchen uſe, and are eaten raw by ſome, and roaſted by others; but they are generally boiled. They are windy, heating, occaſion troubleſome dreams, and cauſe thirſt; and therefore are bad for hot conſtitutions. However, when boiled, and mixed with honey, they are good in diſorders of the lungs, ariſing from a thick clammy phlegm. When roaſted, they are uſed by ſome to ripen boils.

CEPA ASCALONICA, *Scallions*, conſiſt of ſeveral bulbous roots, ſomewhat larger than a hazel nut, have the taſte of common onions, but not ſo ſtrong nor ſo diſagreeable. The leaves are ſlender, fiſtulous, round, ſmooth, and have the ſame taſte. It is uſed in the ſpring, inſtead of green onions, in ſome countries, but it is now much neglected here. It is eaſily propagated, by parting the roots in the autumn, and then they will be ready for uſe in the ſpring. They muſt be planted three or four together, in a hole, at about ſix inches diſtant every way, for they multiply exceedingly. They have the ſame virtues as onions.

CEPULA, *ſive* CEPA FISSILIS, the *Ciboule*, is intirely like the Scallion, only it is larger in every ſenſe, and differs in the acridity of its taſte. They are planted for the ſame uſe as the former.

CERASUS, the *Cherry-tree*, is of different kinds, as the *red garden Cherry*, the *large Spaniſh*, the *red heart*, the *white heart*, the *bleeding heart*, the *black*, the *May*, the *black* or *Mozzard*, the *arch-duke*, the *yellow Spaniſh*, the *Flanders cluſter*, the *carnation*, the *large black*, the *roſe-flowered*, and the *double-flowered Cherry*; the *common white Cherry*, the *wild northern Engliſh, with late ripe fruit*, the *rock* or *perfumed*, the *Cherry-tree with ſtriped leaves*, the *amber*, the *morella*, and the *Hertfordſhire duke Cherry*.

CERASUS SATIVA FRUCTU ROTUNDO RUBRO ET ACIDO, the *common red* or *garden Cherry*, is a tree that is neither tall nor ſtrait, which conſiſts of a great many brittle boughs, with a moderately thick trunk, covered with a reddiſh bark, and the heart is of a blackiſh colour, but the

ſap

ſap is whitiſh. The leaves are large, oblong, ſhining, and crenated on the edges. The flowers are roſaceous, conſiſting of ſeveral white petals, with ſtamina of the ſame colour; the flower cup is divided into five crooked ſegments, from whence ariſes a piſtil, that turns to a well known fruit with long ſlender pedicles. It produces a yellowiſh ſhining gum, without taſte or ſmell.

The *large Spaniſh* CHERRY grows on a tree not much unlike the former, but it is not ſo high, and therefore the ſooner bears fruit. The ſtalk or pedicle is ſhorter and thicker than in the other kinds. Both theſe are cooling; and boiled in water, with a little ſugar, make a pleaſant drink for perſons of hot conſtitutions; but thoſe that have a weak ſtomach, abounding with acid humours, ought to abſtain from them.

Heart CHERRIES are ſo called from being ſhaped ſomewhat like a heart, and the trees have larger leaves than the common ſort; for they are ſomewhat like thoſe of the cheſnut tree, and hang downwards. The fruit has a harder and ſweeter fleſh, and are conſequently more wholeſome. All ſorts of cherries are propagated by budding, or grafting the ſeveral kinds into the ſtocks of the black or wild red Cherries. The ſtones of theſe two kinds are ſown in beds of light ſandy earth in autumn, and when they riſe, they muſt be carefully weeded. They ſhould remain in theſe nurſery-beds till the ſecond autumn after ſowing, at which time you ſhould prepare an open ſpot of good freſh earth, into which you ſhould plant out the young ſtocks, at three feet diſtance from row to row, and about a foot aſunder in the rows. The ſecond year after they are planted out, they will be fit to bud, if intended for dwarfs; but if for ſtandards, they will not be tall enough till the fourth year; for they ſhould be budded or grafted near ſix feet from the ground.

CERASUS NIGRA, *the black Cherry tree*, is tall, with an upright trunk, and covered with a ſmooth, ſpotted, aſh coloured bark, that is greeniſh on the inſide. The leaves are oblong, ſhining, and deeply crenated. The flowers are joined together, as it were in a ſheath, with ſlender, long pedicles or ſtalks, from which proceed round, ſmall, ſweet fruit, with ſomewhat of bitterneſs. It is not now kept in the ſhops; but it is common to ſteep them in brandy for a dram, which is known by the name of cherry brandy.

CHÆREFOLIUM, *Chervil*, has a ſingle white fibrous root, with a ſtalk riſing to a cubit and a half high, which is brown, ſtreaked, hollow, geniculated, ſmooth, and branched. The leaves are like thoſe of hemlock, but leſs, and they, as well as the pedicles or foot ſtalks, are of a faint reddiſh colour, and a little hairy. The flowers grow in umbels on the tops of the ſtalks, and are roſaceous, conſiſting of five white unequal petals, in the ſhape of a heart, with as many white ſtamina, and a flower cup, that changes into two oblong ſeeds, gibbous on one ſide, and flat on the other, which are black when ripe, and in ſhape like the bill of a bird. It is planted in gardens for ſallads, by ſowing the ſeeds in autumn, ſoon after they are ripe, or very early in the ſpring. If it be ſuffered to ſow itſelf, it will thrive better than when cultivated by art. It is ſaid to be inciding, attenuant, and aperient. It promotes urine ſo much, that Geoffroy takes it to be a ſpecific againſt the dropſy, and he affirms, if chervil will not cure it, he does not know what will. The juice ſhould be expreſſed from the freſh herb, or put in an earthen pan, and expoſed to a violent heat, after which the juice is to be expreſſed out. The doſe is three or four ounces, every third or fourth hour; or a decoction may be made of it with water, and then five or ſix ounces is a doſe.

CHAMÆDRYS, *Germander*, or *ground Oak*, has fibrous creeping roots, with quadrangular ſtalks, that are branched and hairy, on which the leaves are ſet by pairs, and are of a beautiful green; they are half an inch long, and near a quarter broad, with a narrow baſe, and crenated from the middle to the end. The flowers ariſe from the places where the leaves join to the ſtalk, and conſiſt of a purpliſh, labiated, ſingle leaf; but the upper lip is wanting, and in its place there are crooked ſtamina, with a forked piſtil. The beard, or lower lip, is divided into five parts, and the middle ſegment, which is largeſt, is hollow like a ſpoon, and ſometimes divided into five ſegments, containing four roundiſh ſeeds, that proceed from the piſtil. Both the leaves and flowers are in uſe, and grow wild in many parts of England. The leaves are bitter, and a little aromatic; they incide groſs humours, reſtore the tone of the ſolids, and promote urine and ſweat.

CHAMÆMELUM, *Camomile*, has a ſlender fibrous root, and ſlender branches, divided into many wings, which are eight inches high or higher. The leaves are ſlender, and cut into five ſegments; the flowers grow at the top of the ſtalks, and are for the moſt part radiated with white petals, and a yellow diſk, which conſiſts of many yellow florets; but the crown is compoſed of white ſemi-florets, and placed upon embryoes, comprehended in a ſcaly cup. Theſe turn into ſlender, oblong, naked ſeeds. The whole plant has a phyſical ſmell, which is not diſagreeable. It grows wild in great plenty, on moſt of the large heaths near London, and is propagated for uſe, in phyſic gardens, by parting the roots, and planting them about eight or ten inches diſtant, every way, for they ſpread greatly. The proper time is in March, and they thrive beſt in a poor ſoil.

CHAMÆMELUM FŒTIDUM, *ſive* COTULA FŒTIDA, *ſtinking Camomile*, has a fibrous root, with round, greeniſh, brittle, ſucculent ſtalks, divided into many wings. It is thicker and higher than common camomile, with larger leaves, of a blackiſh green colour; but the flowers are much the ſame. It is eaſily known by its ſtrong ſmell. The floret tops, and the leaves of both, are in uſe, but more particularly the flowers. Common camomile is an excellent carminative, and powerfully diſcuſſes wind, curing the cholic proceeding from thence, as well as in the convulſive cholic. They are alſo good in diſeaſes of the breaſt, and more particularly in tumours of the ſtomach, proceeding from a violent heart-burn; as alſo in pains of the gravel. Externally, they are emollient and diſcutient, and are excellent in bruiſes, to diſperſe coagulated blood. Hence they are uſed in fomentations, cataplaſms, paregoric cliſters, uterine injections, and baths. The common method of taking them is as tea.

CHAMÆPITYS, *ground Pine*, has a ſlender, fibrous, white root, with ſtalks partly upright, and partly lying on the ground. They are villous, nine inches high, and two leaves proceed from every knot, an inch in length, and are ſomewhat in ſhape like thoſe of the pine tree, from whence it has its name; they are of a yellowiſh green. The flowers proceed from the places where the leaves join to the ſtalk, and have only a ſingle petal, and a ſingle lip; they are of a yellowiſh colour, and the lower lip is divided into three ſegments, the middlemoſt of which is parted in two. In the room of the upper lip, there are a few teeth, with ſtamina, of a light purpliſh colour. The flower cup is villous, divided into five ſegments, and contains four triangular brown ſeeds. The whole herb is in uſe, and has a pitchy or turpentine ſmell.

CHAMÆPITYS MOSCHATA, *Muſk ground Pine*,

Pine, creeps on the ground like the former, but the ſtalks are harder. It has the ſame ſort of flower, but of a purple colour, and the ſeeds are black, curled, and longiſh. The whole herb is very hairy, with a bitter taſte, and a ſtrong reſinous ſmell, with ſomewhat of the ſcent of muſk. Theſe are numbered among the vulnerary, aperient, cephalic, hyſterick, and nervine plants. The doſe of the powder is a drachm, either alone, or with that of germander, in red wine; but it may be boiled in whey, when wine is not proper, and the decoction drank every morning.

CHEIRI, the *Wall-flower*, has a flower compoſed of four yellow petals, which are placed in the form of a croſs, and out of the flower cup riſes the piſtil, which becomes a long flat pod, divided by a partition, into two cells, to which the valves adhere on both ſides, and are furniſhed with ſmooth round ſeeds, with borders round their edges. The leaves are green, and acuminated at the end. It grows upon old walls, and flowers in June. They are ſaid to be cordial, to eaſe pains, and to be good in the apoplexy and palſy.

CHELIDONIUM, *Celandine*, has a fibrous hairy root, and the lower leaves are large, a ſpan long, lobated, of a fine green above, but of a bluiſh green below, and a little hairy. The lobes are roundiſh, have ears, and are placed one againſt another; they have alſo large veins and inciſures. The ſtalks riſe to a cubit in height, and upwards, are knotty, brittle, fiſtulous, and branched with leaves alternately placed. From the places where they join to the ſtalks at the top, flowers proceed, with a pedicle, a palm in length, and flowers collected in umbels. The flowers conſiſt of four gold coloured petals, placed in the form of a croſs, and the calyx conſiſts of two leaves which ſoon fall off. The piſtil of the flowers turns to a pod, an inch and a half long, which is round, ſlender, bivalved, and a little wrinkled; it is at firſt green, afterwards reddiſh, and pours out black, ſhining, roundiſh, flat ſeeds. The whole plant has a ſtrong ſmell, and wherever it is wounded, pours out a liquor of a ſaffron colour, which is acrid and biting. It delights in watery ſhady places, and may be propagated, by ſowing the ripe ſeeds in any corner of the garden. The colour of the root is red, and it is full of a bitter, acrid, burning juice. Some have given it inwardly to open obſtructions, to promote urine and ſweat, and to cure the dropſy; but others think it not ſafe for inward uſe, for in ſome caſes, an infuſion of two ounces of the root has been attended with dreadful ſymptoms. It is common to rub warts with the juice, to take them away.

CHELIDONIUM MINUS, *Pile-wort*, has a root conſiſting of tubercles, of the ſize of a grain of wheat, with many ſlender whitiſh fibres, which are pale without, but white within. The ſtalks riſe to a palm in height, are ſlender, and moſt of them lie on the ground; the leaves are roundiſh, ſmooth, and ſhining, like thoſe of ivy; and on the top of the ſtalks there is a roſaceous flower, like a ranunculus, conſiſting of eight or nine petals of a gold colour, placed in a circle. There are many ſaffron coloured ſtamina in the middle, placed in a cup, conſiſting of three leaves. The piſtil is placed in the middle of the flower, and turns to a roundiſh prickly fruit, of a greeniſh yellow colour. It grows in meadows, and by the ſides of high-ways. The leaves are without acrimony; but the roots are ſaid to cool and moiſten. It is looked upon as an antiſcorbutic plant, and the freſh leaves are eaten in ſome places as a ſallad.

CICHORIUM, *wild Succory*, has a root a foot in length, and about as thick as a man's thumb, with a few fibres, and full of a milky juice. The ſtalk is ſtrong, hairy, branched, and grows to a cubit and a half high, with leaves like thoſe of dandelion, but larger, and they are hairy, and of a dark green colour. The flowers conſiſt of many bluiſh ſemi-florets, placed upon an embryo, contained in a calyx, which being contracted, turns to a capſula, full of angular, naked, ſhort ſeeds. The leaves and roots are bitter, and it not only grows wild, but is planted in gardens, and flowers in June. The fruit, leaves, and flowers, are in uſe, but the wild is better than the garden ſuccory. Some uſe it as a ſallad, when young. It is accounted good to reſolve thick clammy humours, and to ſtrengthen the ſolid parts, as well as to temperate the hot intemperaries of the viſcera; for which reaſon, it has been given in recent obſtructions of the liver, and againſt the jaundice. The juice taken in large quantities, ſo as to keep up a gentle diarrhœa, and continued for ſome weeks, has been found to be excellent againſt the ſcurvy, and other chronical diſorders. The doſe of the juice is four ounces.

CICUTA, *Hemlock*, has a root a foot in length, and as thick as one's finger, and before the ſtalks are produced, ſolid, and before they are grown, fungous. The ſtalk is ſtreaked, fiſtulous, ſmooth, and grows to the height of three cubits and upwards; ſome are greeniſh, others reddiſh, and others again ſpotted like ſerpents. The winged leaves are cut into many minute ſegments, and nearly reſemble thoſe of parſley, for which it has been often taken while young. The flowers are collected in umbels, on the top of the ſtalks, and are roſaceous, conſiſting of five white petals, in the ſhape of hearts. The calyx turns to a globous fruit, containing two ſmall ſeeds, gibbous on one ſide, and ſtreaked on the other; and of a paliſh green colour. The whole plant has a diſagreeable ſtrong ſmell. We have ſeveral hiſtories both of its good and bad effects, which render it probable, it was not the ſame plant that was eaten. We ſhall take no notice of the properties aſcribed to this plant by Dr. Stork; for, though we greatly admire that gentleman, and believe what he ſays reſpecting *Hemlock*, and its effects in Germany, yet we have the mortification to find it does not produce the ſame effects in England. Outwardly it is ſometimes applied to hard and ſcrophulous tumours, and to reduce the ſize of women's breaſts, when they are grown too large; as alſo to keep back the milk in thoſe that do not give ſuck.

CINARA HORTENSIS, the *Artichoak*, has a thick ſtrong root, with leaves a foot, or a foot and a half in length, divided into ſeveral broad ſegments, beſet with a hairy down. At the top of each branch there is a turbinated head, ſurrounded with large acuminated ſcales, which are fleſhy, and of a bluiſh green colour, and are very thick at the bottom. The ſcaly head or calyx being taken off, there are ſeen underneath flowers, conſiſting of many florets, of an elegant greeniſh purple, which are divided into five parts, and placed upon embryoes, each of which turns to an oblong ſwelling ſeed, covered with a ſmooth aſh coloured rind, and furniſhed with long down. The lower part of the cup or placenta, is fleſhy, and is the part which is eaten.

CARDONES, the *ſpiny Artichoak*, differs in nothing from the former, but in having prickles at all the corners of the leaves and flower cup.

The manner of propagating the firſt ſort, is from ſlips or ſuckers, taken from the old roots in March, which, if planted in a good ſoil, will produce large fair fruit in the autumn following. The prickly artichoak, or chardon, is propagated by ſeed in the middle of March, which ſhould be ſown in an open bed of light rich earth. When the plants appear above ground, they ſhould be carefully weeded, and in dry weather often watered. In the middle of May, they will be fit to tranſplant into beds of light

rich earth, placing them in rows a foot aſunder, eight inches diſtant from each other, obſerving to water them conſtantly, till they have taken root. In the beginning of July, they will be ſtrong enough to plant out for good, in a ſpot of light rich ground, placing them in rows of four feet diſtant each way, obſerving to water them conſtantly as before, till they have taken root. In Auguſt they will be fit to tie up with hay bands, in a dry day, bringing the leaves as cloſe together as poſſible, without bruiſing them. Then with a ſpade the earth muſt be banked up round the plants, leaving about ten inches, or a foot of the tops uncovered, taking care that the earth does not get into the middle. As the plants advance in height, they muſt be earthed up from time to time; for, if they thrive kindly, they will grow to the height of four feet, and will, when taken up for uſe, be near three feet, when trimmed of their outer leaves; for the tender branched part is only valuable. This by ſome is accounted a great delicacy.

Some eat the fleſh of the ſmooth Artichoaks with ſalt and pepper, they being thought proper to help digeſtion. As for their phyſical uſes, they are not ſaid to have any, only the roots are commended to promote urine.

CITREUM CITRUM, *ſive* MALUS MEDICA. The *Citron tree* is called MALUS MEDICA, becauſe it was firſt brought into Europe from Media; it is of a moderate height, with a branched ſpreading root, yellowiſh without, and whitiſh within. The trunk is ſlender, the wood white and hard, and the bark of a pale green. The boughs are numerous, long, ſlender and tough, and the oldeſt of them are of a light yellowiſh green, and armed with pale prickles; but thoſe that are more recent, are of a beautiful green. The tops of the branches are tender, and of a browniſh red green, as well as the leaves, which are of the ſize of thoſe of the walnut-tree, generally blunt, but now and then acuminated, and they are three times as long as they are broad; the lower part is not ſo green as the upper, and the edges are a little ſerrated. The tree is always cloathed with them, both winter and ſummer, and when they are held up againſt the ſun, they appear to have holes in them, like St. John's wort, or rather full of tranſparent ſpecks. The flowers grow on the tops of the branches, and are roſaceous, with fleſhy petals, which are generally five in number, and ſtand almoſt upright; without they have a reddiſh bluſh, but are white within, and placed in a ring. The calyx is ſmall, and divided into five ſegments, and under the yellow apex there are a great many ſtamina, and part of the flowers are fruitful, and part barren. Among the ſtamina there is a longiſh piſtil, the rudiment of the fruit, and thoſe flowers that are without never produce any. The ſhape of the fruit is oblong, but ſometimes globous, and ſome terminate in a point, while others are blunt; the ſurface is wrinkled and tuberoſe, and is often nine inches in length, and upwards. The ſize is different, as well as the weight; for ſome weigh ſix, nine, and even thirty pounds. The outer rind is tough, thin, bitter, and hot, and the colour is at firſt green, which turns to that of gold, when ripe; the inner or white rind is thick, firm, ſweetiſh, with a little acidity. Within it is divided into ſeveral cells, full of an acid juice; the ſeeds are numerous, for ſometimes an hundred and fifty have been found therein; they are oblong, half an inch in length, and ſharp at both ends; they are bitter, yellow without, covered with a ſtreaked ſkin, and contain a double white kernel. In hot countries both flowers and fruit may be ſeen on the tree at the ſame time, as well in the ſpring as the autumn; but they are more plentiful in the laſt.

CITRONS are not uſed as an aliment, but as a ſauce, and are cut into ſmall ſlices, as we do lemons, to garniſh the diſhes, and to ſqueeze upon the meat. The acid is very agreeable, excites a weak appetite, and helps digeſtion, when uſed moderately. The outward rind, on account of its hardneſs, is not eaſy of digeſtion. It is an excellent remedy againſt the ſcurvy, and is a kind of ſpecific to cure that diſeaſe, as well as the juice of oranges and lemons; when the gums of patients, afflicted with that diſeaſe, are ulcerated, this juice will cure them. The juice is alſo good in burning and malignant fevers, to quench thirſt, and to reſtrain the heat and effervеſcence of the blood. Beſides, the juice of citrons is diuretic, cleanſes the kidneys of ſmall gravel, and reſtrains vomiting, proceeding from bilious humours. The flowers, as well as the leaves, have an exceeding fine refreſhing ſmell, though they will not prevent contagion on this account, as ſome pretend. The outer yellow bark has alſo a very fine aromatic ſmell, becauſe it has a prodigious number of veſicles full of eſſential oil. Being chewed, it mends the breath, and by its bitterneſs ſtrengthens the ſtomach; it powerfully diſcuſſes wind, and concocts crude humours in the ſtomach and inteſtines. However, the juice is not good in the pleuriſy, inflammation of the lungs, ſpitting of blood, a conſumption, and the like.

MALUS LIMONIA, the *Lemon tree*, is placed here on account of its affinity with the former, and is pretty tall, though not very full of branches; the leaves are like thoſe of the citron tree, but ſhorter, and the prickles are more numerous, but leſs, and venomous. The flowers have much the ſame ſmell, and the ſhape of the fruit is likewiſe oval, but ſhorter, and not of ſo deep a yellow. Likewiſe, the rind is thinner, and they are much more full of juice, which is more acid than that of citrons. Upon which account it is thought to be more cooling, and more efficacious in hot diſeaſes; in ſhort, what has been ſaid of the juice of citrons, may in moſt reſpects be applied to this.

COCHLEARIA HORTENSIS, *garden Scurvy-graſs*, has a white, thickiſh, ſtrait, fibrous and hairy root, with many roundiſh leaves, of a deep green colour, about an inch in length, which are hollow, almoſt like a ſpoon; they are thick, full of juice, and placed upon pedicles, a palm in length. The ſtalks are branched, upright, ſmooth, a cubit in height, and have leaves that are more jagged than thoſe next the root; they are alſo longer, and without pedicles. The flowers have four petals, which are white, and in the form of a croſs, with a calyx, conſiſting of four leaves, and a piſtil that turns to a membranaceous round fruit, the ſixth part of an inch in length, and compoſed of two cells, full of ſmall, round, reddiſh ſeeds. But a diſtinction ought to be made between the garden and ſea ſcurvy-graſs; for the leaves of the former are always roundiſh, and of the latter ſinuous. It is propagated by ſowing the ſeeds at the latter end of July, ſoon after they are ripe, in a moiſt ſhady ſpot of ground. When the plants are come up, they ſhould be thinned ſo, as to be left at four inches diſtance each way, and in the ſpring they will be fit for uſe; for thoſe that are ſuffered to remain will run up to ſeed in May. They muſt be ſown every year.

This plant has its Engliſh name from its virtue in curing the ſcurvy, againſt which it is accounted a ſpecific. In ſome parts of England they brew an ale therewith, which is recommended by many to cure the ſame diſtemper. However, it is more effectual when mixed with ſorrel, or ſome ſuch acid herb, becauſe of itſelf it is too hot, and if uſed too freely, will produce bad ſymptoms. The people that inhabit cold countries, are not ignorant of this mixture, for they have learnt by long experience, that ſcurvy-graſs, and ſorrel together, make an excellent

remedy againſt this diſeaſe. Scurvy-graſs is not uſeleſs in other diſeaſes; for it is excellent in recent obſtructions of the viſcera, in the green ſickneſs, and ſome ſort of aſthma; but the dried leaves are not near ſo valuable as the freſh. The doſe of the leaves, in decoction, is from a pugil to a handful, and of the juice from one ounce to three. Externally it is good in ſcorbutic diſorders of the mouth, in the bloody ſwelling of the gums, and to faſten looſe teeth, the gums being rubbed with the juice, or held in the mouth as a gargle.

COLCHICUM, *meadow Saffron*, whoſe flowers appear, near the beginning of autumn, before there are any leaves. Theſe flowers conſiſt of a ſingle petal, which proceed from the root itſelf, and are in the form of a very ſmall white tube, divided into ſix ſegments. They are ſomewhat like the florets of ſaffron, but of a lighter colour, with internal ſtamina, of a pale yellow, and a piſtil ariſing from the bottom of the flower, and terminating in ſlender hairs. In a day or two's time they begin to wither; but in the following ſpring, three or four oblong, broad, ſmooth, flat leaves, ſhoot out, like thoſe of the white lily. Between theſe are ſeen three or four thick, oblong, triangular bladders, like pods, divided into three cells, which open when they are ripe, and are full of a reddiſh, black, roundiſh ſeed. The root is bulbous, turbinated, but flat on one ſide, on which is a furrow, when in flower, that does not appear at any other time. It is covered with a blackiſh coat, and has a few fibres at the bottom. The bulb itſelf is fleſhy, white, and when freſh, it pours out a milky juice as ſoon as taken out of the ground; but when it is dried, it is blackiſh without, reddiſh within, and of a ſweetiſh taſte, with a little bitterneſs. The ſmell of the whole plant is ſtrong and nauſeous. Both antients and moderns agree, that the root is poiſonous, and thoſe that eat it feel an itching all over the body, with a biting pain of the internal parts, and of the ſtomach, with great heat, which afterwards turns to a bloody flux.

CONSOLIDA MAJOR, the *greater Comfrey*, has thick fleſhy roots, divided into ſeveral parts, black without, but white and clammy within. The ſtalks grow to the height of a cubit and a half, and are light, hairy, rough, and winged. The leaves are two ſpans in length, and a palm in breadth; they are of a dark green, rough, hairy, and ſharp at the point. The flowers grow at the top of the branches, and are placed in elegant rows, and before they open are rolled up like the tail of a ſcorpion; they are pendulous, conſiſt of one flower, in the ſhape of an oblong funnel, and are of a whitiſh or purpliſh colour; they are a quarter of an inch in length, and ſlightly divided into five ſegments; the cup is alſo divided into five parts, and has a long piſtil of the ſame colour with the flower, which turns into four ſeeds, that are black and ſhining, and reſemble vipers heads. It grows wild on the ſides of banks and rivers, in ſeveral parts of England, and may be propagated by ſowing the ſeed, or parting the roots in autumn, which is beſt. They ſhould be planted about eighteen inches aſunder, that they may have room to ſpread. The root is only in uſe, and has the ſame qualities as that of marſh-mallows. The doſe of it in powder, is to a drachm, and in decoction or infuſion to an ounce. It is commended in ulcers of the lungs, and other diſorders that proceed from the acrimony of the humours.

CORIANDRUM, *Coriander*, has a ſlender, white, ſingle root, with a few fibres; as alſo a ſingle, ſlender, round, ſmooth ſtalk, full of pith, that is branched, and riſes to the height of a cubit and a half. The lower leaves are broad, and conjugated, but the upper are deeply cut into five ſegments; the flowers grow in umbles, at the top of the branches, and are roſaceous, and of a whitiſh purple colour; they conſiſt of five petals, in the ſhape of a heart, with a calyx that turns to two ſeeds, that, when together, make up a whole ſphere; they are green at firſt, but afterwards of a paliſh yellow. The ſmell of the whole plant is ſtrong and aromatic; but that of the ſeeds becomes more mild, and they have a ſweet agreeable taſte. This plant is propagated by ſowing the ſeeds early in the ſpring, in an open ſituation, and in a bed of good freſh earth; when the plants are come up, they ſhould be hoed out to about four inches every way. The ſeeds have a carminative virtue, and are good againſt catarrhs, flatulencies, worms, the cachexy, and ſlight obſtructions of the glands. The doſe of the ſeed, in powder, is from a ſcruple to a drachm.

COTONEA MALUS, the *Quince tree*, is of ſeveral kinds, as the *Pear Quince*, the *Apple Quince*, the *Portugal Quince*, the *Quince tree, with oblong, ſmooth, ſweet fruit*, the *Quince tree with leſſer oblong, downy fruit, which are not eatable, and the common Quince tree, with narrow leaves.*

It is a dwarf tree, with a branched root, and is covered with a brown bark; it is ſometimes ſtrait, and has many ſlender branches on the top. The leaves are roundiſh pointed, and of the ſize of thoſe of the apple tree; they are not cut on the edges, and on the lower part they are covered with a ſoft down, but on the upper they are greeniſh and ſmooth. The flowers grow ſingle, and are roſaceous like the wild roſe, conſiſting of five roundiſh petals, half an inch broad, and of a fleſh colour; in the middle there are many purple ſtamina, with yellow apices, and the flower cup is compoſed of five greeniſh, hoary, villous leaves, which, when the fruit is grown, appears at the top thereof. The fruit is of different ſhapes, which have been above taken notice of; the ſeeds are in the middle of the quince, and are like thoſe of pears; but they are rendered ſlippery by a ſort of ſlime that covers them. When quinces are unripe, they are ſeldom or never eaten, eſpecially raw; but when they are boiled, they are very well liked by ſome. They are greatly aſtringent, ſtrengthen the ſtomach, and may be of ſome uſe in all ſorts of fluxes. The uſe of quinces is very well known for the making of marmalade; the ſeeds are ſo mucilaginous, that an ounce of them will render three pints of water thick and ropy, like the white of an egg. A ſpoonful of the marmalade is good in coughs, for it incides clammy phlegm, and cauſes expectoration; and it is the more valuable, becauſe thoſe that refuſe other medicines will take this.

CUCUMIS SATIVUS VULGARIS, the *common Cucumber*, has ſtrait roots, with many white fibres, and thick, long, branched, hairy ſtalks, creeping on the ground, on which are leaves alternately diſpoſed, a palm or two in breadth, ſerrated on the edges, and rough to the touch. They are furniſhed with claſpers, and the flowers proceed from the places where the leaves join to the ſtalks, which are in the form of a bell, divided into five ſegments, and half an inch in length. They are of a pale yellow, and ſome are fruitful, others barren; the fruitful have an embryo, which turns to a fruit that is ſometimes ſix inches long, and is extremely well known. The ſeeds only are in uſe, and are reckoned among the four greater cold ſeeds. As for the fleſh or pulp, it is unfit for nouriſhment, and is generally offenſive to the ſtomach, eſpecially if not corrected with a good deal of pepper, as well as vinegar. However, they agree extremely well with ſome who eat them frequently, without any bad conſequence. The ſeeds are cooling, and ſometimes emulſions of them have been preſcribed in burning fevers, a fit of the gravel, and heat of urine.

CUCUMIS AGRESTIS, *wild Cucumber*, has a root two or three inches thick, and divided at the bottom into various fibres; it is white, fleſhy, and has

has a bitteriſh and nauſeous taſte. The ſtalks lie on the ground, and are rough, thick, and furniſhed with leaves above a palm in length, that are roundiſh, acuminated, and have ears at the baſe. The flowers proceed from the hollows where they join to the ſtalk, and conſiſt of a ſingle petal in the ſhape of a bell, which is deeply divided into five parts, and is of a yellowiſh colour with greeniſh veins. The fruit grows to two inches in length, is in the ſhape of a cylinder, and covered over with rough ſtuds. It is divided into three cells full of a bitter juice, and when ripe, they pour it out upon the ſlighteſt touch in a violent manner with the ſlippery ſeeds, which are broad, ſmooth, and blackiſh. It grows in the ſouthern parts of France, near the highways and among rubbiſh, and is alſo planted in gardens, not only for variety, but for diverſion upon the above mentioned account. It may be propagated by ſowing the ſeeds in the ſpring in an open warm border; and, when the plants are come up, they ſhould be tranſplanted into an open bed, about ſix or eight feet diſtant, becauſe they creep very far. The fruit is ripe in autumn, and the ſeeds will ſow themſelves without any farther trouble. Elaterium is made of the juice of the ripe fruit, and is a moſt violent purge, and particularly evacuates ſerous humours both upwards and downwards; for which reaſon ſome preſcribe it in a dropſy, and give half a grain at firſt, and afterwards from two or three to five; however, it ſhould be exhibited very cautiouſly.

CUCURBITA, *the Gourd*, has ſtalks as thick as one's finger, that run along the ground, or climb by the help of claſpers; the leaves are round, and are from a foot to a foot and a half broad, and covered with a down, as well as a little crenated at the edges. The flowers proceed from the hollows where the leaves join to the ſtalk, are white, and in the ſhape of bells; they are cut into five ſegments, but ſo deep that they ſeem to be ſo many petals. Some of the flowers are barren, others fruitful, which laſt have an embryo that turns into a fruit, which is ſometimes two yards long; but this is very rare. It has a thick neck and a moderate belly; and, when ripe, has a hard rind, of a yellowiſh colour, with a white taſteleſs pulp, or fleſh, that is pretty ſpongy. It is divided into five cells, containing oblong flat ſeeds, almoſt an inch in length; but have ſometimes a border round them. There are four ſorts, namely, the *Long Gourd, with a ſoft leaf and a white flower*: the *ſickle ſhaped Gourd, with a ſoft leaf and a white flower*; the *flat Gourd, with a ſoft leaf and a white flower*, commonly called *Squaſhes*; the *bottle ſhaped Gourd, with a ſoft leaf and white flower*. There are ſeveral other varieties every year brought from America; but the ſeeds will not produce fruit of the ſame ſhape for two years together. They may be all propagated by ſowing the ſeeds on a hot bed; when the plants are come up, they ſhould be removed to a moderate bed; and when they have got four or five leaves, they ſhould be tranſplanted into holes made upon an old dunghill; but they ſhould be allowed a great deal of room to creep, becauſe ſome have run forty feet from the holes; and if the ſide branches were permitted to remain, they would overſpread twenty rods of ground. The ſeeds are numbered among the four greater cold ſeeds, and emulſions made therewith temperate the acrimony of the urine, and often procure reſt.

CUPRESSUS, *the Cypreſs tree*, is of five kinds, namely, the *common Cypreſs tree*, the *male ſpreading Cypreſs*, the *Virginian Cypreſs, with leaves like Acacia, that fall off in winter*, the *ſpreading Portugal Cypreſs with ſmaller fruit*, and the *American Cypreſs with the leaſt fruit*, commonly called *white Cedar* in America. The firſt ſort has a ſtrait thick trunk, paliſh, and ſometimes reddiſh, and a very ſweet ſmell. The male has a ſpreading top, but in the female it is collected as it were into a point. It is an ever-green, and the leaves are like thoſe of ſavine, the ſhoots being very ſmall, and ſeemingly covered with ſcales. The catkins conſiſt of very ſmall leaves, or ſcales, and under them are apices that pour out an extremely fine powder; the fruit grows on other parts of the tree; this is roundiſh, and compoſed of many woody tubercles; and in the clefts between them there are reddiſh, hard, angular ſeeds, round at one end and ſharp at the other. It is very common in many of the old gardens in England; but at preſent is not much in requeſt, though for what reaſon is hard to ſay. Theſe trees are all propagated from ſeeds, which ſhould be ſown early in the ſpring, on a bed of warm, dry, ſandy earth, ſifting the ſame earth over them to half an inch thick; in a month's time the young plants will appear above ground, and ſhould be often watered in dry weather. In two years time they will be ſtrong enough for tranſplantation into a nurſery, and the beſt ſeaſon is the middle of April, in a cloudy day, at the diſtance of eighteen inches in rows, obſerving to cloſe the earth well to their roots. They may remain here three or four years; and when they are planted out for good, it ſhould be at the diſtance of twenty feet every way, taking care not to ſhake the earth from the roots.

CYANUS, *Blue-bottle*, has a woody fibrous root, and ſtalks that ſometimes riſe to the height of a cubit and a half, which are angular, hollow, covered with down, and branched. The lower leaves are ſinuated, not much unlike thoſe of dandelion; but the reſt are narrow and long, with a ſingle nerve running through the whole length. The flower has a ſcaly hairy cup, and the diſk is almoſt flat, but the outer florets round the border are large, tubulous, and deeply cut; the inner florets are leſs, and the colour of them all is generally blue, though ſometimes they are of other colours. The firſt are always barren, but the others are ſucceeded by a ſingle naked ſeed. It increaſes greatly by its creeping root, and is only fit for large borders under trees, or in wilderneſſes, becauſe it will overſpread the plants that grow near it. They are propagated by taking off ſets from the old roots, either in ſpring or autumn, and will grow in any ſoil or ſituation.

CYCLAMEN, *Sow-bread*, has a thick, globular, fleſhy root, but ſomewhat flattiſh, white within, and blackiſh without. It has a pungent, burning, diſagreeable taſte, and from it proceed leaves that are almoſt round, growing on pedicles a palm in length; they are pretty much like thoſe of cuckow-pint, but not ſo thick, and are of a blackiſh green above, with white ſpots; but below they are purpliſh, and a little ſinuated on the edges. The flowers have long tender pedicles, and conſiſt of a ſingle globous petal divided into five or ſix ſegments, that turn down almoſt to the bottom; they are ſometimes of a light, and ſometimes of a dark purpliſh colour, with a ſweet ſmell; the piſtil is fixed in the hinder part of the flower, like a nail, and when the flower falls off it curls and bends down to the ground, where it turns to a globous membranaceous fruit, full of oblong angular ſeeds, adhering to a placenta. Theſe being ſown always turn to a root, from whence the leaves afterwards proceed; but it does not flower till autumn, and then it is before they have any leaves. There are ſeveral ſorts, and particularly one with a white flower; they are both propagated by ſowing the ſeeds ſoon after they are ripe, in tubs of freſh earth, and in four or five years time they will begin to flower. At firſt the roots are ſmall, and will produce but few flowers; but they will grow to upwards of fourteen inches in diameter, and then they will produce above an hundred flowers. When the root is dried it will loſe its acrid taſte, and yet it

will continue to be a violent purge. Country people will take a drachm of it in powder, and half an ounce in decoction; but the internal uſe of it is not very ſafe. However, outwardly, it is recommended againſt hard ſcirrhous and ſcrophulous tumours, when applied in the form of a cataplaſm.

DAUCUS CRETICUS, *the candy Carrot*, has a long root, about as thick as a man's finger, and has a taſte ſomewhat like a parſnip; the ſtalk, which is round, ſtreaked, and hairy, grows to the height of about nine inches, on which there are downy aſh coloured leaves, divided into narrow ſegments; however, they are ſometimes ſmooth, and of a blackiſh green colour. The flowers grow in umbels at the top of the ſtalks, and are ſmall, roſaceous, and conſiſt of five white petals, whoſe calyx turns to a fruit compoſed of two oblong ſtreaked ſeeds, that are gibbous on one ſide and flat on the other; they are hairy, and in ſhape reſemble lice.

DENS LEONIS, *Dandelion*, has a root as thick as one's little finger, and the leaves are oblong, acuminated, and lacteſcent, with deep inciſions on the edges like wild ſuccory, but are ſmoother, and lie on the ground. It has no ſtalk, and the pedicles are naked, fiſtulous, round, and above a palm in length; though there is ſometimes a little hair, which comes readily off; on theſe the flowers are placed, which conſiſt of many petals that open in the form of a marygold, and are of a yellow colour. The cup of the flower is ſmooth and divided into many parts, without which there are four or five green leaves that turn backwards; the ſemi-florets in the middle have each their proper embryo, and turn to a reddiſh or citron coloured ſeed, furniſhed with long hairy down. It is accounted an aperient, and to open the obſtructions of the viſcera. Boerhaave is of opinion, that, when it is uſed for a conſiderable time, it will diſſolve almoſt all kinds of coagulations, and open the moſt obſtinate obſtructions of the viſcera.

DIGITALIS, *Foxglove*, has many ſlender fibrous roots, with a ſtalk that ſometimes grows to two cubits in height; it is thick, angular, hairy, reddiſh, and hollow, with oblong, acuminated, hairy leaves, ſerrated on the edges, of a blackiſh green above, and hoary below. Thoſe at the root have long pedicles, and thoſe at the ſtalks are placed without any regular order. The flowers are diſpoſed in a long ſpike, and always pendulous, growing on one ſide of the ſtalk, with ſhort hairy pedicles; they conſiſt of a ſingle petal, and ſomewhat reſemble the finger of a glove, from whence it has its name; but it is open at the top, and has, as it were, a lip on each ſide; it is of a purple colour, excepting the lower part, where it is whitiſh or fleſh coloured. In the lower part of the flower there are purple or white crooked ſtamina, with apices of a ſaffron colour. The piſtil is ſlender, purpliſh, fixed in the back part of the flower, like a nail, and turns to a fruit, or pod, which ends in a point and opens in the middle, it being divided into two cells full of ſmall, angular, reddiſh ſeeds; the cup of the flower is generally compoſed of five leaves. This plant is by many thought to be poiſonous, and yet there are country people who give it as a purge in agues; but it works very violently. Some recommend it externally againſt ſcrophulous ſwellings, and for that purpoſe ſet the flowers in the ſun in May butter, in order to extract their virtues, and this is uſed as an ointment; but it muſt be continued a long while.

DRACUNCULUS, *ſive* DRACONTIUM, *Dragons*, or *the many leaved Arum*, has a root that lies deep in the earth, which is almoſt of an orbicular form, and fills the palm of the hand, with many white capillaments and a yellow rind. The ſtalk is ſingle, ſtrait, and thicker than one's thumb; it grows to a cubit and a half high, and is round, ſmooth, and of ſeveral colours, like the ſkin of a ſerpent. The leaves have pedicles nine inches in length, and are divided into digitated ſegments, which are ſix or ſeven in number or upwards; they are oblong, narrow, ſmooth, ſhining, and there are ſhafts not ſo thick as a man's little finger, and at the top there is a vagina, or ſheath, a foot long, of an herbaceous colour without, but within of a reddiſh purple; when it is unfolded, it turns to a flower with a ſingle petal, in ſhape like an aſs's ear, within which there is a blackiſh, long, thick piſtil, bigger than that of arum, and ends in a ſharp point; at the baſe there are a collection of ſeveral apices and embryoes, each of which turns into a globous juicy berry, diſpoſed like a bunch of grapes, and are all at firſt green, and afterwards red; they contain a hard ſeed or two that are ſomewhat wrinkled. The berries have a hot biting taſte. It is cultivated in gardens, and is propagated by the knobby roots, which in two or three years time will afford many off-ſets. The beſt ſeaſon for tranſplanting them is in autumn, after the decay of the leaves; they ſhould be ſet in an open place and in a light ſoil. The root and leaves have the ſame virtues as arum, and are ſaid to diſſolve groſs humours in the lungs and viſcera, to open obſtructions, and promote urine. The doſe of the dried root, in powder, is from one drachm to two. Externally, the root is an excellent remedy againſt inveterate ulcers; but the fruit is more powerful than the leaves or root.

DRACUNCULUS PRATENSIS, *meadow Dragon*, ſometimes grows to three cubits in height, and has a crooked geniculated root, furniſhed with large long fibres; the ſtalk is round, ſmooth, fiſtulous, ſlender, and yet pretty ſtiff. The leaves are placed in no regular order; they are ſerrated with ſharp rough teeth on the edges, and are of a blackiſh green ſhining colour, of a hot taſte, but milder than pellitory of Spain. The higheſt part of the ſhaft is angular, hairy and divided into ſprigs, on which are umbellated white radiated flowers, twice or thrice bigger than thoſe of yarrow; their diſk conſiſts of ſeveral florets ſet cloſe together, and divided into five ſegments; but the crown of ſemi-florets is placed upon embryoes in a ſlender ſhort cup, that afterwards turns to ſlender ſeeds; it flowers in July, and the root and leaves have been ſometimes in uſe. The root being eaten is ſaid to purge the head and cure the tooth-ach. Some eat them in ſallads.

DRACUNCULUS ESCULENTUS, *Tarragon*, grows to the height of two cubits and upwards. At firſt the leaves are divided; but when they are full grown, they become like thoſe of flax or hyſſop, of a ſhining blackiſh green colour. The flowers grow on the top of the branches in bunches, and conſiſt of florets ſo ſmall that they are hardly viſible; however, upon examination, they appear to be tubulous, and divided into five parts at the top, under which are embryoes placed in a ſcaly cup; each embryo turns to a ſmall naked ſeed. The whole plant is very acrimonious, is aperient, diuretic, and proper to open obſtructions; being chewed it provokes ſpittle like pillitory of Spain. It is mixed with ſallads by ſome to correct the coldneſs and crudity of other herbs, and becauſe it is good for a cold ſtomach.

EBULUS, *dwarf Elder*, is ſomewhat like common elder, but ſeldom grows ſo tall as a man; the root is long, fleſhy, white, ſpreading, and of a bitteriſh, ſubacrid, and nauſeous taſte; the ſtalks are herbaceous, angular, ſtreaked, and geniculated, with frequent joints, and are pithy like common alder; the leaves conſiſt of three or four conjugations, with a ſingle leaf at the end; they are longer than the leaves of common alder, as well as ſharper, and are ſerrated on the edges. The flowers are ſmall, grow

in umbels, are white, and conſiſt of a ſingle petal divided into five ſegments; they have five white ſtamina, and as many ruſty coloured apices; when the flowers are fallen off, the flower cups turn into berries, which are black when ripe, and the juice will colour the fingers purple. It is found wild in ſome counties of England, but near London is cultivated for uſe. It multiplies exceeding faſt, and, if permitted, will ſoon over-run a large ſpot of ground. The off-ſets of theſe roots may be tranſplanted any time from September to March, and will grow in any ſoil or ſituation. The leaves of this plant are bitteriſh, and the berries very bitter, with ſomewhat of an aſtringency. It is a ſtrong purge, but the roots are moſt powerful as well as its bark. They have been frequently given in the dropſy, but with different ſucceſs; however, it ſhould not be exhibited at all, except to thoſe that have ſtrong conſtitutions. The powder of the ſeeds is given to a drachm; but a rob made of the berries is the moſt proper to purge off water in dropſical patients, and may be exhibited from half an ounce to an ounce.

ENDIVIA, *ſive* INDYBUS, *Endive*, is of three ſorts, the *broad leaved* or *common Endive*, the *narrow leaved* or *leſſer Endive*, and the *curled* or *Roman Endive*. The firſt has fibrous roots full of milk, and the leaves ſpread on the ground before the growing of the ſtalk. The leaves are like thoſe of lettuce, and now and then crenated on the edges, and a little bitteriſh: thoſe that grow on the ſtalk are like thoſe of ivy, but leſs. The ſtalk riſes ſometimes to a cubit and a half in height, and is ſmooth, ſtreaked, light, and divided into many crooked branches, which pour out a milk when wounded. The flowers and ſeeds are like thoſe of ſuccory. *Narrow leaved Endive* differs only from the former in having more narrow leaves, and a more bitter taſte. The *Roman* or *curled Endive*, has leaves that are bigger than thoſe of the common, which are ſinuated on the edges; the ſtalk alſo is larger, thicker, and more tender, and the ſeeds are black. The firſt and ſecond ſorts are now diſuſed in kitchen gardens, as being vaſtly inferior to the curled kinds. The ſeaſons for ſowing the ſeeds are in May, June, and July, at four or five different times; but that which is firſt ſown is very apt to run to ſeed, eſpecially if the autumn prove warm and dry; however, it is neceſſary to have a little ſown in May for the firſt crop. They ſhould be ſown in an open ſituation, and in a good rich ſoil, but not too thick. When they are come up, and grown to about two inches high, they muſt be tranſplanted into another good open ſpot of ground, at about ten inches diſtant every way, obſerving to cut off the largeſt leaves before you plant them, as alſo to water them conſtantly every other evening until they have taken freſh root. Some of the largeſt muſt be tied up with oſier twigs to blanch, which ſhould be done in a dry afternoon. You muſt firſt gather up all the inner leaves of the plant regularly into one hand, and then thoſe on the outſide that are ſound, pulling off all that are rotten and decayed, placing them as near as poſſible in the natural order of their growth; then tie it up with a twig very cloſe, about two inches below the top, and about a week after go over the plants again, and give them another tie about the middle. This muſt be done for the two firſt ſowings; but thoſe of the latter ſowings ſhould be taken up in a very dry day, and, with a ſharp pointed dibble, plant them into the ſides of trenches of earth, which are laid very upright, ſideways towards the ſun, with the tops of the plants only out of the ground, ſo that the haſty rains may run off, and the plants be kept dry and ſecured from froſt. They will be fit for uſe in about a month's time, after which they will not keep good long, and therefore freſh ones ſhould be put into the trenches every fortnight at leaſt, that you may have a conſtant ſupply. The blanched leaves are more tender and more agreeable to the palate than the green. They are cooling and aperient, and ſerve to temperate the heat of the blood and bilious humours. They are good in the jaundice and bilious fevers, and four ounces of the juice is a doſe.

ENULA CAMPANA, *Elecampane*, has a thick fleſhy root, of a duſky colour without, but white within, with an acrid, bitteriſh, aromatic taſte. The leaves are a cubit in length, and almoſt a ſpan broad; they are of a pale green above, hoary underneath, crenated on the edges, ſharp at both ends, and ſoft to the touch. The ſtalks riſe to three or four cubits in height, and are ſtrait, villous, ſtreaked, branched, and ſupport radiated gold coloured large flowers, whoſe florets are hermaphrodites, but the ſemi-florets are female; the embryoes which are placed on a naked placenta are crowned with down, and are all included in a ſcaly cup. Elecampane grows wild in moiſt fields and meadows in ſeveral parts of England, and is cultivated in the gardens near London. It may be propagated by ſeeds, or with the ſmall off-ſets furniſhed with buds at the top. The ſeeds ſhould be ſown in a moiſt bed of light earth ſoon after they are ripe, and they generally remain in the ground till the following ſpring; when the plants appear, they ſhould be weeded and watered in a dry ſpring; ſhould remain in the bed till the Michaelmas following, and then be tranſplanted in rows about a foot aſunder, and nine inches diſtant in the rows, making the holes deep enough, and putting the crown of the root juſt under the ſurface of the ground; then tread the earth gently about them with your feet. The roots will be fit for uſe the Michaelmas following. The root is of great uſe as well recent as dry: it opens obſtructions of the glands, helps catarrhs, and has often been found good in atrophies. It is ſudorific and diuretic, and has been found of ſervice in feveriſh diſorders. It is likewiſe good in difficulty of breathing, and the moiſt aſthma. The doſe of the freſh root is from half an ounce to an ounce in decoction, and of the dry, in powder, from a drachm to two drachms. It alſo helps digeſtion, by reſtoring the loſt tone of the ſtomach, and by inciding and expelling the impurities contained in the ſtomach and inteſtines. For the ſame reaſon, it is good in cholic pains proceeding from wind, and cleanſes the kidnies. Spirituous liquors extract its virtues much better than the watery.

ERUCA, *Rocket*, has a white, woody, ſlender root, with hairy ſtalks that riſe to a cubit, or a cubit and a half in height. The leaves are like thoſe of muſtard, they being long and narrow, with deep inciſions on each ſide. The flowers at the top of the ſtalks conſiſt of four petals, in the form of a croſs, of a whitiſh yellow colour, with blackiſh ſtreaks. The cup is hairy, from whence riſes a piſtil, that turns into a pod like that of muſtard, but longer, with a partition in the middle. It is divided into two cells full of yellow ſeeds, larger than thoſe of muſtard, and not ſo round. The ſmell of this plant is ſtrong and diſagreeable, as well as the taſte. There are ſeveral ſorts of rocket that are planted in phyſic gardens, but are of no great uſe. They may be propagated by ſowing their ſeeds in the ſpring, on a bed of light earth, where they will ſoon come up, and will be large enough for uſe in a ſhort time; when young, they are eaten by ſome as a ſallad. This plant is ſaid to excite the appetite and help digeſtion, to ſtrengthen the ſtomach, and to promote urine.

ERYSIMUM, *Hedge Muſtard*, has a ſingle, white, woody root, about as thick as one's little finger, and the ſtalks riſe to two cubits in height, which are round, firm, rough, and branched. The firſt leaves

are a palm in length, and are hairy, being divided into ſeveral triangular ſegments, of which the uppermoſt is the biggeſt. The flowers are ſmall, and placed in rows on the branches; they conſiſt of four yellow petals, in the form of a croſs, with a hairy calyx conſiſting of four leaves. The piſtil is changed into a pod half an inch or longer, which is horned and divided into two cells, containing many ſmall bay hot ſeeds. It is accounted good in old coughs, the aſthma, and other diſorders of the lungs; for it not only diſſolves viſcid matter in the lungs and fauces, but alſo in the ſtomach and inteſtines, whence it is good in cholics proceeding therefrom. The doſe of the leaves in decoction is a handful, and of the ſeeds, which are beſt, to a drachm. Theſe laſt are good in a ſuppreſſion and difficulty of urine; and ſome eſteem them very much for their good effects againſt the gravel.

ESULA MINOR, *the leſſer Spurge*, has a woody fibrous root, about the thickneſs of the little finger, which has a nauſeous, acrid, pungent taſte; the ſtalks grow to a cubit in height, and the leaves are placed very thick thereon; they are at firſt like thoſe of toad flax, but afterwards grow much more ſlender and capillaceous. The flowers grow on the top of the branches as it were umbellated, and conſiſt of a ſingle petal, which is in the ſhape of a flower, and of a greeniſh colour, but divided into four ſegments. The piſtil changes to a triangular fruit, in which are three cells containing three roundiſh ſeeds. The whole plant is full of milk, and grows by the way ſides and in woods.

EUPATORIUM CANNABINUM, *Hemp Agrimony*, has a thick crooked root, with many large fibres; the ſtalks riſe to two or three cubits high, and is ſtrait, round, downy, of a purpliſh green colour; and alſo full of white pith. The leaves grow thick upon the ſtalks, and are like thoſe of hemp, they being oblong, acuminated, and ſerrated on the edges. The flowers are collected into umbels on the top of the branches, and conſiſt of many tubulous florets of a purpliſh colour, divided into five parts at the top, with long capillaments or double piſtils, placed upon an embryo in a long, round, ſcaly cup. The ſeeds are pappous, or furniſhed with a long hairy down. It grows in waters, and in watery places. It is ſaid to be hepatic, aperient, and vulnerary; and the leaves have a very bitter taſte, with a great degree of pungency. It is ſaid to be greatly prevalent againſt the cachexy, and Boerhaave informs us, that it is the conſtant medicine of the turf-diggers in Holland againſt ſcurvies, foul ulcers, and ſwellings of the feet, to which they are ſubject. Many drink it like tea ſeveral times a day; and others give three ounces of the juice. Externally, the leaves and floret tops boiled in wine are good againſt watery ſwellings.

EUPHRASIA, *Eye-bright*, has a ſingle ſlender root, with a few large fibres; the ſtalks riſe to the height of a palm and a half, and are round, a little hairy, and blackiſh, with leaves about a quarter of an inch long, that are roundiſh, ſmooth, though a little wrinkled, and of a duſky green. They are placed by pairs oppoſite to each other, without any pedicles. The flowers grow on the top of the branches, and conſiſt of a ſingle whitiſh petal, ſtreaked with purple and yellow lines, and divided into two lips. The upper lip is upright, cloven, obtuſe, crenated, and hides a few ſtamina; but the lower is divided into three ſegments, in the ſhape of hearts. The calyx is divided into four parts, and contains a piſtil fixed in the back part of the flower, like a nail, which turns to a fruit or flat capſula a quarter of an inch long, divided into two cells full of exceeding ſmall, oblong, aſh coloured ſeeds. It is common in mountainous and woody places. This plant has been greatly celebrated for curing diſorders of the eyes; but it is not acknowledged at preſent to have any ſuch virtues. It is ſaid to diſſolve the thick groſs humours, eſpecially of the brain. The doſe of the leaves, in powder, is from one drachm to three, thrice a day.

FABA MAJOR HORTENSIS, *Windſor Beans*, has a root that is partly ſtrait and partly creeping, with a quadrangular ſtalk, that is light and has ſeveral ribs. The conjugation of the leaves are not exact; for there has been ſometimes three, four, five, or more, of an oblong roundiſh ſhape, that are flat, of a bluiſh green, veinous and ſmooth. The flowers proceed from the hollows where the ribs join to the ſtalk, and, though ſeveral of them are together, they have but one pedicle; they are papilionaceous, and are ſucceeded by a long pod, ſo well known that it needs no deſcription. There are ſeveral ſorts of beans, as the *Mazen Bean*, which is the firſt and beſt ſort of early beans at preſent known, and are brought from a ſettlement of the Portugueſe on the coaſt of Africa, near Gibronta. The ſeeds of this ſort are much leſs than thoſe of a horſe-bean, and if they are ſown in October, under a warm hedge or wall, and are carefully earthed up as they grow, they will be ready for the table in May. The *early Portugal Bean* differs little from the former, though it is not ſo well taſted; but is commonly uſed by gardeners for their firſt crop. The *ſmall Spaniſh Bean* will come up ſoon after the former, and is much ſweeter. The *Sandwich Bean* comes up ſoon after the *Spaniſh*, and is almoſt as large as the Windſor bean; but, being more hardy, is commonly ſown a month ſooner. The *Toker Bean* comes up about the ſame time with the *Sandwich*, and, as it is a great bearer as well as that, it is now much planted. The *white and black bloſſomed Beans* are in great eſteem by ſome; but all theſe ſorts are very apt to degenerate, if their ſeeds are not preſerved with great care. The *Windſor Bean* is allowed to be the beſt of all, and is the largeſt. It is ſeldom planted before Chriſtmas, becauſe it will not bear the froſt ſo well as any of the former. Thoſe that are planted in October will come up about a month after, and, as ſoon as they are two inches above ground, the earth ſhould be carefully drawn up with a hoe to the ſtems; and this muſt be repeated two or three times, which will protect them againſt the froſt; but, if the winter proves very ſevere, it will be proper to cover them with peaſe haulm, fern, or ſome other light covering, which muſt be taken off in mild weather. The *Horſe Bean* delights in a ſtrong moiſt ſoil, that lies quite open; for they never thrive well on dry warm land, or in ſmall incloſures. The ſeaſon for ſowing theſe beans is from the latter end of February to the beginning of April, according to the nature of the ſoil.

With regard to the nature and faculty of beans, authors are not agreed; but the common opinion is, that they are windy and hard of digeſtion. Some have doubted the nouriſhing quality of beans; but innumerable experiments have eſtabliſhed their credit beyond all contradiction. The meal of dried beans is reckoned among one of the four reſolvent meals, and is uſed by ſome as a cataplaſm, boiled in milk, to reſolve and ſuppurate tumours. The water diſtilled from the flowers is looked upon as a coſmetic, and is ſtill in uſe, to take away ſpots on the face.

FILIPENDULA, *Drop-wort*, has a fleſhy blackiſh root, which terminates in ſeveral branches or fibres, and near the ends there are knobs, or bulbs, ſomewhat longer than an olive. There are ſeveral leaves that proceed from the root, which are finely cut into narrow ſegments, and are of a blackiſh green colour; the ſtalk is generally ſingle, erect, and about a foot in height. It is ſtreaked, branched, and has but few leaves, and the flowers grow on the top of the

the ſtalks in umbels; they are roſaceous, conſiſt of ſix white petals, which are a little reddiſh on the outſide; there are many ſtamina and red apices, placed in a cup conſiſting of a ſingle leaf that has a great number of points. The piſtil turns into a globous fruit, compoſed of eleven or twelve rough flat ſeeds, and are ſo placed together in a head, reſembling a tub. It grows wild in many parts of England, upon heaths and commons. The leaves of drop-wort have an aſtringent, ſaltiſh, glutinous taſte; the whole plant is ſaid to incide and attenuate groſs humours, and to carry them off by urine. The doſe of the root, in powder, is a drachm, and ſome have looked upon it as a ſecret to cure the bloody flux, when given in wine or the yolk of an egg.

FŒNICULUM VULGARE, *common Fennel*, has a perennial root, and is about as thick as one's finger; it is ſtrait, white, and has a ſweetiſh aromatic taſte; the ſtalk riſes to the height of three cubits, which is ſtrait, round, ſtreaked, geniculated, ſmooth, ſlender, and covered with a greeniſh rind; it is full of a ſpongy white pith, and divided into many twigs towards the top. The pedicles ſurround the ſtalk and branches like a ſheath, from whence proceed the leaves, that are divided into ſlender ſegments, or capillaceous jaggs, of a dark greeniſh colour, with a ſweet taſte and ſmell. It is an umbelliferous plant; for the flowers grow in umbels at the ends of the branches, and are roſaceous, and conſiſt of five yellow petals; the calyx turns to a fruit compoſed of two oblong thickiſh ſeeds, gibbous and ſtreaked on one ſide, and plain on the other.

FŒNICULUM DULCE, *ſweet Fennel*, differs little from the former, only the ſtalk is not ſo high nor ſo thick, and the leaves are leſs; but the ſeeds are larger, ſtreaked, whitiſh, more ſweet, and leſs acrid. They are propagated by ſowing the ſeeds ſoon after they are ripe, and when the plants are come up, they ſhould either be tranſplanted, or hoed out, to the diſtance of ſixteen or eighteen inches each way. The ſeeds muſt not be ſuffered to ſhead on the ground; for then they will overrun every thing that grows near them. The Sweet Fennel is annual, and muſt be ſown in March, in a warm ſoil and open ſituation. They ſhould be hoed out at the diſtance of ten inches from each other, and in Auguſt the ſeeds will be ripe; ſoon after which the roots will decay. The beſt ſeeds are thoſe that are brought from abroad, which are ſo cheap, that it is not worth cultivating here. Theſe plants are diuretic, aperient, ſudorific, ſtomachic, pectoral, and febrifuge. The root is numbered among the five aperient roots. The powder of the ſeeds is given from half a drachm to a drachm, with ſugar in wine. The whole plant, as well as its ſeeds, is greatly cried up againſt dimneſs of the eye ſight, eſpecially for thoſe that have hurt their eyes by reading in the night time; for which purpoſe the powder of the ſeeds ſhould be taken every morning faſting with ſugar. The eſſential oil is a great carminative, and from ſix to twelve drops, on a lump of ſugar, are a doſe. It is good againſt the flatulent cholic, and helps digeſtion. The uſe of green fennel with fiſh is very well known.

FŒNUM GRÆCUM, *Fænugreek*, has a ſlender, white, ſingle, woody root, from whence proceeds a ſtalk, that riſes to the height of half a cubit, which is ſlender, green, hollow, and divided into wings or branches; and there are three leaves growing upon one pedicle, like thoſe of meadow trefoil; they are ſlightly ſerrated on the edges, and are ſometimes more broad than long; they are green on the upper ſide, and of an aſh colour below. The flowers proceed from the places where the pedicles join to the ſtalk, and are papilionaceous and whitiſh, changing to pods a palm, or a palm and a half in length; they are flattiſh, a little crooked, narrow and ſlender, with a long, light, ſlender, ſword-like point; they contain many ſeeds that are yellowiſh, and have no very agreeable ſmell. They have a mucilaginous taſte, and the meal made therewith ſoftens, digeſts, ripens, diſcuſſes tumours, and eaſes pains.

FRAGARIA, the *Strawberry plant*, has a perennial reddiſh root, conſiſting of many capillaceous fibres, of an aſtringent taſte. The pedicles are a palm in length, and are ſlender, hairy, and branched at the top, ſome of which ſuſtain leaves, and others flowers; there are three leaves on every pedicle that reſemble thoſe of cinquefoil, which are veinous, hairy, ſerrated on the edges, of a greeniſh colour above, but whiter below. There are four or five flowers upon one pedicle, that are roſaceous, and conſiſt of five whitiſh petals, with as many ſhort ſtamina ſuſtaining yellow apices. The piſtil is globous, and placed in a cup compoſed of ten parts or ſegments. The piſtil turns to a globous fruit, which when ripe is red, though ſometimes whitiſh, and is very well known. It grows wild in ſhady places, and is cultivated in gardens. They are of ſeveral ſorts, as the *common*, or *wood Strawberry*; the *common Strawberry with white fruit*; the *Hautboy*; the *Virginian Strawberry with ſcarlet fruit*; the *large Chili Strawberry*; the *globe Hautboy*; and the *Strawberry with a ſmall greeniſh white fruit*. The firſt and ſecond ſorts are found wild in the woods, from whence they are tranſplanted into gardens, where the fruit is improved, the beſt ſeaſon for which is early in the ſpring, if the weather proves moderate. The beſt ſoil for theſe plants is freſh loam, not over rich, and the ground ſhould be well dug. It ſhould be made quite level, and marked out into beds about three feet and a half wide, leaving a path between each bed two feet broad. In theſe beds may be planted four rows, and the plants ſhould be at leaſt eight inches aſunder in the rows, when they are deſigned for the wood ſtrawberry, for the others will require more room. If it is a dry ſpring, they ſhould be well watered, otherwiſe there will be no fruit; and the beds muſt be well weeded from time to time. They will not continue to bear well above three years. Strawberries are cooling, quench thirſt, looſen the belly, promote urine, and expel ſmall gravel. They ſhould be eaten with cream, becauſe with milk they curdle upon the ſtomach. The roots and leaves are diuretic and aperient, for which reaſon they are recommended by ſome in obſtructions of the viſcera, and the jaundice.

FUNGUS CAMPESTRIS ESCULENTUS VULGATISSIMUS, the *common eſculent Muſhroom*, when it firſt appears is globous, after which it expands by little and little, and underneath there are reddiſh plates placed near together all round; on the upper part it is ſmooth and white; the fleſh is extremely white, and it has a ſhort thick pedicle. The ſmell and taſte are good when it firſt appears out of the earth, and it ſhould be gathered before it is expanded; for when it is older, it has a ſtronger ſmell, and is of a browniſh colour. It grows almoſt every where in woods and paſture grounds after rain. They have now a method of cultivating it in gardens; in order for which ſome are to be ſought for in Auguſt and September, and having found them you muſt open the ground about the roots, where you will often find the earth full of ſmall white knobs, which are off-ſets, or young muſhrooms. Theſe ſhould be carefully gathered, preſerving them in lumps with the earth about them. The beds to receive this ſpawn ſhould be made with dung, in which there is plenty of ſalts. Theſe beds ſhould be made on dry ground, and the dung ſhould be laid upon the ſurface; the breadth ſhould be two feet and a half from the bottom, and the

the length in proportion to the quantity of mushrooms desired. The dung should be a foot thick, and covered with about four inches of strong earth; then lay more dung ten inches thick; and then another layer of earth, still contracting the sides of the bed so as to form it like the ridge of a house. This done, it should be covered with litter, or old thatch, to keep out the wet, and to prevent its drying. It must remain thus eight or ten days, and the spawn, which should be always kept dry till it is used, should be thrust into the bed after the covering is taken off, and another of earth put on, about an inch thick. It should be laid in lumps two or three inches asunder, and then covered with the same light earth half an inch thick, over which the litter must be laid again to keep out the wet. The spring and autumn are the best seasons for this purpose; for then the mushrooms will appear in about a month. The bed will continue good for several months, and produce great quantities of mushrooms; and they will likewise supply you with fresh spawn, which must be laid up in a dry place till the proper season.

GALEGA, *Goats Rue*, has slender, woody, white, fibrous, perennial roots, and stalks that rise to the height of two cubits and upwards, which are light, streaked, and divided into several branches. The leaves are winged like those of vetches, and there is always a single one at the end; but they are longer and terminate in a soft thorn. The flowers are of the papilionaceous kind, and are white, or of a whitish purple colour. It consists of the standard, the wings, and the keel; and the pistil becomes a long taper pod, containing oblong seeds, in the shape of a kidney. It grows wild in Italy, but with us is cultivated in gardens. This may be propagated either from the seeds, or by parting of their roots. The best season for sowing the seeds is in the beginning of March, in a light soil, and in an open situation; when the plants are come up, they should be well weeded, and, if they are too close, some of them should be pulled up, leaving the rest at eight or nine inches distant from each other. The next year these plants will flower, and produce ripe seeds. The roots may be parted into small heads, in order for their increase in autumn. It is accounted a great alexipharmic, and has been commended in pestilential fevers, and for the epilepsy in children. The herb may be eaten either crude or boiled, or a spoonful of the juice may be given for a dose. Some look upon this herb as a great prefervative against the plague, and likewise affirm it to be good to kill worms.

GALEOPSIS, *dead Nettle*, or *stinking dead Nettle*, has a creeping root, with slender fibres proceeding from the joints; the stalks rise to the height of a cubit, or a cubit and a half, and are square, hairy, light, and branched. The leaves are placed by pairs opposite to each other, and are somewhat broader than the common nettle, but sharp at the points, and serrated on the edges; they are covered with a sort of down, and on the tops of the stalks and branches there are spikes of flowers, which consist of a single petal, which is labiated, and the upper lip is hollow like a spoon; but the under one is divided into three segments, of which the middlemost is the largest; the stamina, as well as the flower, are of a purple colour, with a strong disagreeable smell. The cup of the flower is in the shape of a funnel, divided into five parts, the pistil is fixed to the back part of the flower like a nail, and is attended with four embryoes, that turn to as many oblong seeds, which when ripe are black. It is said to be vulnerary, and that when the fresh leaves are bruised and laid upon old ulcers it will heal them in a short time.

GALEOPSIS ANGUSTIFOLIA FŒTIDA, *narrow leaved stinking dead Nettle*, differs very little from the former in either form or virtues.

GALLIUM LUTEUM, *Ladies Bed-straw*, or *Cheese Rennet*, has a small, creeping, slender, woody, brown root, from which square stalks proceed to a cubit in height. The leaves are placed at the joints of the stalk, in a radiated form, and are five or six in number; they are long, narrow, slender, soft, and of a darkish green colour. From every joint proceed two branches, on which are flowers consisting of a single petal, in the form of a bell, which is expanded towards the upper part, and divided into four segments. The calyx turns to fruit composed of two dry roundish seeds. Some of the modern physicians commend it against the epilepsy, and give a drachm of the powder for a dose, of the juice four ounces, and a handful in decoction.

GENISTA, *Broom*, is a shrub that sometimes grows to be as tall as a man; the root is hard, woody, tough, yellow, and furnished with crooked fibres. The stalks are slender, woody, and many twigs proceed from them, that are angular, green, tough, and about them there are small, hairy, dark green leaves, sometimes growing three together, and sometimes single. The flowers that grow thereon are of a beautiful yellow, and papilionaceous, with crooked stamina, and saffron coloured apices; to which succeed flat broad pods, which are blackish when ripe, and full of flat, hard, reddish seeds in the shape of a kidney. It grows in barren grounds all over England. There are several sorts of these plants cultivated in gardens, and they may be propagated by seeds, which should be sown on a moderate hot bed in the spring; as soon as the plants are strong enough to remove, they should each be set in a pot filled with light earth, and it will be safest to plunge the tender kinds of them into a very temperate hot bed, where they should be shaded till they have taken root; then they should be inured to the open air by degrees; but in winter they should be placed in a good green-house, and in mild weather they should have as much free air as possible. Several of them are useful in dying, and therefore they have the name of dyers weeds. Common broom is intensely bitter, and the leaves, tops, and branches, decocted in wine or water, are useful in dropsies, and in all obstructions of the kidnies and bladder; for they partly purge off the serous humours by stool, and partly by urine. A drachm and a half of the seeds will purge very briskly, and sometimes vomit. In some places they mix the flowers with sallads, without any bad effects.

GERANIUM SANGUINEUM, *bloody Cranes bill*, has a red thick root, and many long thickish appendages, with a few fibres, and every year new shoots proceed from the roots. It has several stalks that arise to a cubit in height, that are reddish, hairy, geniculated, and divided into many wings. A pair of leaves proceed from every knot, which are divided into several parts, and are hairy and green above, but hoary below; there are oblong pedicles that proceed from their upper wings, which sustain a single flower, and is the largest of any that belong to this kind of plants; it is of a beautiful red colour, composed of five petals of the same colour, and ten small stamina, that are supported by five hairy, greenish, small leaves. The bill is in the shape of a pentagon, and contains swelling tailed seeds, which are thrown out by the twisting of the bill. There is another Geranium, called *Geranium Batrachoides, Crow-foot Cranes-bill with a blue flower*, which has all the characters of the former, except the colour. Bloody cranes-bill is styptic, and has been used in vulnerary decoctions, or broths. Doves foot cranes-

bill has the ſame virtues as the former, and a ſyrup made of the juice is commended againſt the bloody flux.

GROSSULARIA, *the common Gooſeberry*, is a ſhrub, and has a woody root; it is ſometimes two cubits high or higher, and is full of branches, with a bark, when full grown, of a purpliſh colour, and there are long ſharp thorns at the riſe of the leaves, two or three of which are placed together. Theſe have ſhort pedicles, and are of the breadth of a man's nail, or ſomewhat broader, and are laciniated or jagged. The flowers are ſmall, and ſeveral of them proceed together from the ſame tubercle as the leaves, and have a very ſhort, hairy, reddiſh pedicle; they are roſaceous, conſiſting of five petals of an herbaceous whitiſh colour, with a calyx conſiſting of a ſingle leaf in the ſhape of a baſon, and divided into five reddiſh ſegments bending downwards, with five ſtamina and a greeniſh piſtil. The hinder part of the calyx turns into a globous berry univerſally known. There are ſeveral ſorts of gooſeberries, beſides this, cultivated in gardens, as the *large manured Gooſeberry*, the *red hairy*, the *large white Dutch*, the *large amber*, the *large green*, the *large red*, the *yellow leaved*, and the *ſtriped leaved Gooſeberry*. Theſe are propagated by ſuckers taken from the old plants, or by cuttings, which is beſt. The beſt ſeaſon for planting them is in autumn, juſt before their leaves begin to fall; always taking the handſomeſt ſhoots, that proceed from branches that bear the greateſt quantity of fruit. They ſhould be ſix or eight inches long, and planted in a border of light earth, about three inches deep, and expoſed to the morning ſun, obſerving to water them a little when the weather proves dry; when they begin to grow, the under ſhoots ſhould be rubbed off, leaving only the uppermoſt and ſtrongeſt. In October following, theſe plants will be fit to remove to an open ſpot of freſh earth, in which place they may remain for a year, and all the lateral ſhoots ſhould be taken off, ſo as to leave the ſtem clear about a foot above the ſurface of the earth. In a year's time they may be removed to the place where they are to remain. The beſt ſeaſon for tranſplanting them is in October. As to their phyſical virtues, nothing need to be ſaid about them, they being only eaten for pleaſure, or uſed to make gooſeberry wine.

HEDERA TERRESTIS, *Ground Ivy*, has a creeping fibrous root, with ſlender, quadrangular, reddiſh, hairy ſtalks, on which the leaves are placed by pairs on long pedicles; they are roundiſh, an inch broad, hairy, and crenated; the flowers grow on the top of the ſtalks, and conſiſt of a labiated ſingle petal. The upper lip is divided into two ſegments, that turn back to the ſides, and the lower into four ſegments, and the tube is variegated within with deep purple ſpots and lines, and the opening of the mouth is covered with a ſort of white down. The piſtil is ſlender and forked, and the calyx is oblong, narrow, ſtreaked, and divided on the edges into five ſhort ſegments, which, when the flower decays, has a ſwelling belly, containing four oblong, roundiſh, ſmooth ſeeds. The whole plant is opening, cleanſing, diſcutient and vulnerary. It is excellent for wounds and ulcers of the viſcera, and is good in the beginning of a conſumption. The doſe of the tops, reduced to powder, is from half a drachm to a drachm twice a day. It is alſo good againſt the gravel as well as the cholic. Ray affirms, that the powder, ſnuffed up the noſe, will cure a violent headach. It is common about London to infuſe the dried leaves in malt liquor, and then it goes by the name of gill-ale.

HEDERA ARBOREA, *common Ivy*, is well known in moſt parts of England, and ſometimes grows very large, forming a ſort of a tree; at other times faſtening itſelf to trees, walls, houſes, and churches. It ſends forth roots or fibres from its branches, by which it faſtens itſelf to whatever is near it, from which it receives a great part of its nouriſhment; the leaves are angular, and the flowers conſiſt of ſix leaves, that are ſucceeded by black berries, which grow in round bunches, each of which contains four ſeeds. The leaves are ſaid to be heating, drying, and ſubaſtringent; but are ſeldom given inwardly, becauſe they are offenſive to the nerves. The berries purge upwards and downwards, and the leaves applied to corns will take them away in a ſhort time. The gum has been treated of in the former part.

HELIANTHEMUM TUBEROSUM, *ſive* HELIANTHEMUM INDICUM TUBEROSUM, *the Potatoe plant*. One ſtalk or more riſes from each root, which is green, ſtreaked, rough, hairy, and attains the length of twelve feet or upwards, full of a white ſpongy pith. The leaves are many, placed in no order, and from the bottom to the top; are greeniſh, rough, broad, and acuminated like thoſe of the common ſun-flower, but not ſo much wrinkled nor ſo broad. The ſtalks ſoon after their riſe are branched, and the leaves decreaſe in ſize from the bottom to the top. The flowers grow on the top of the ſtalks, and are of the ſize of marygolds, and radiated. The diſk conſiſts of many yellow florets, with a crown compoſed of twelve or thirteen ſtreaked pointed gold coloured ſemi-florets, placed on embryoes in a ſcaly villous cup. The embryoes turn into ſmall ſeeds, and the ſtalk emits ſeveral ſlender creeping roots, that ſpread themſelves on all ſides, between which there are many tuberoſe roots, ſometimes adhering to the chief root, and ſometimes connected to long fibres a foot diſtant from them. One root will produce thirty, forty, fifty, or more potatoes. Theſe are reddiſh or whitiſh without, and conſiſt of a whitiſh ſubſtance, or fleſh, with a ſweetiſh taſte, and are often bigger than a man's fiſt. They continue in the ground all the winter, and the next year they ſpring again. This plant has been greatly propagated in England for more than fifty years paſt; for, though it was brought from America in 1623, it was not much cultivated before, becauſe they were then thought only fit for poor people; but now they are in general eſteem. It is propagated here by the roots, which if large are cut into pieces, preſerving a bud or eye in each; but the beſt method is to plant the fineſt roots entire, allowing them a pretty large ſpace of ground between the rows, as alſo each root, and then thoſe that are produced will be large the following autumn. A light ſandy loam is beſt, if not too dry or moiſt; it ſhould be well ploughed two or three times, and the deeper the better. They are very nouriſhing, abate the acrimony of the blood and juices, and are conſequently good in diſorders of the breaſt. Some people in France eat them raw with ſalt and pepper.

HERNIARIA GLABRA, *ſmooth Rupture-wort*, and HERNIARIA HIRSHUTA, *hairy Rupture-wort*, are both ſmall herbs that lie on the ground, and are divided into ſeveral branches that proceed from a ſmall root, which deſcends directly downwards; the ſtalks are round, reddiſh, and full of joints, at each of which there are very ſmall leaves, placed in pairs oppoſite to each other, leſs than thoſe of dodder, and of a yellowiſh green colour. From the ſame joints there proceed many flowers that are ſmall, yellowiſh or white, without petals; but there are many ſtamina. The piſtil turns into a very ſhining ſmall black ſeed, contained in an oblong ſtreaked capſula, that was the calyx of the flower. It is a very mild aſtringent, and is likely to be of ſome ſervice in a flaccid ſtate of the viſcera. The doſe of this herb, in powder, is a drachm; and, when a handful of the herb is ſteeped in a pint of wine

wine or water, five or ſix ounces may be given at a time.

HORMINUM, *Clary*, has a ſingle, woody, brown root, with many fibres, from whence ariſes a ſtalk to the height of two cubits, about as thick as one's finger, quadrangular, hairy, geniculated, and divided into branches; it is full of a white pith, and the leaves are ſet by pairs oppoſite to each other, which are hoary, wrinkled, of a roundiſh oblong ſhape, a ſpan in length, and half a ſpan broad, terminating in a point, and a little dentated or crenated on the edges; they are a little hairy, and gradually decreaſe in ſize from the bottom to the top. The flowers proceed from the places where they join the ſtalk, and conſiſt of a labiated ſingle petal, whoſe upper lip is long and falcated, with a ſlender crooked piſtil, cloven at the top, and attended with four embryoes; there are two ſtamina with oblong apices, that are hid thereby; but the lower lip is divided into three ſegments, the middlemoſt of which is hollow like a ſpoon. The calyx is tubulated, ſtreaked, glutinous to the touch, and divided into five ſmall ſpines, whereof three ariſe above the flower, and the other two are below. The embryoes at the bottom of the calyx, when they are ripe, turn to four large roundiſh ſeeds, gibbous on one ſide, angular on the other, ſlippery, and bright, and of a reddiſh colour. It is found dry on many banks in various parts of England; but there are many other ſorts that are cultivated in gardens. The leaves and flowers are given in decoction in water and wine, in ſome caſes peculiar to women. It is uſually drank as tea.

HYOSCYAMUS NIGER VULGARIS, *black Henbane*, has a thick, wrinkled, long root, divided into many parts, brown without, and white within, with broad, ſoft, hairy leaves, of a light green colour, and deeply cut on the edges; they are placed in an irregular order, or branched, thick, roundiſh, hairy ſtalks, that ariſe to a cubit in height. There are long rows of flowers on the ſtalk, that conſiſt of a ſingle petal in the ſhape of a funnel, with a ſhort cylindraceous tube, and is divided into five obtuſe ſegments, of a yellowiſh colour on the edges with purpliſh veins; but the middle is of a blackiſh purple, with five ſhort purple ſtamina, and thick oblong apices; the piſtil is long and white, with a round apex, and the calyx is hairy, oblong, and conſiſts of a ſingle leaf, having ſtiff acuminated teeth on the edges, of which there are five in number; this turns to a fruit in the ſhape of a pot with a cover to it, and is divided into two cells, containing ſeveral aſh coloured, ſmall, roundiſh, wrinkled, flat ſeeds. The whole plant has a diſagreeable ſmell, that renders the head heavy and produces ſleepineſs. It is very common in England, growing on the ſides of banks and old dunghills every where.

HYOSCYAMUS ALBUS, *white Henbane*, differs from the former in having ſofter and leſſer leaves, covered with a greater plenty of white down, as alſo whiter ſeeds. They have been only uſed externally to eaſe pains, and to abate the acrimony of the humours; however, it is not ſafe uſed any way, for it produces extreme ſleepineſs, and ſtrange fantaſtical dreams.

HYPERICUM, *St. John's-wort*, has a woody, fibrous, yellowiſh root, with many ſtiff, woody, round, reddiſh, branched ſtalks, that riſe to the height of a cubit or higher; the leaves are placed thereon by pairs oppoſite to each other, but without pedicles; they are above half an inch long, a quarter of an inch broad, ſmooth, and with nerves that run throughout the whole length; when they are held up to the ſun, they ſeem to be perforated with a great number of holes, which are nothing elſe but veſicles full of an oily juice. The flowers grow on the extremities of the branches, and are roſaceous, conſiſting of five gold coloured petals, in the middle of which there are a great number of capillary ſtamina, with golden apices. The cup is compoſed of five leaves, contains a thick piſtil divided into three parts, and placed in the center of the flower; turns to a capſula divided into three cells, containing very ſmall, oblong, browniſh black ſeeds. Both the flowers, and the head full of ſeeds, when rubbed, yield a red juice. The leaves have a ſaltiſh, biteriſh, ſtyptic taſte, and the whole plant is accounted the principal of the vulnerary kind; for which reaſon it is recommended to cure wounds both inwardly and outwardly, as well as for ſpitting and piſſing of blood. The doſe of the floret tops, in decoction or infuſion, is a handful, and ſometimes the leaves and ſeeds are preſcribed to a drachm. *St. John's-wort*, applied outwardly, is an excellent vulnerary, and cures wounds, bruiſes, and ulcers.

HYSSOPUS, *Hyſſop*, has a woody, hard, fibrous root, about as thick as one's finger, with ſtalks that grow to the height of a cubit, which are branched and brittle. The leaves are placed by pairs oppoſite to each other, and are from an inch to an inch and a half in length, and only a ſixth part of an inch broad. They are ſharp, ſmooth, of a duſky green, with an acrid taſte, and a ſweet ſmell. The flowers grow at the tops of the ſtalks, and are large, blue, labiated, and conſiſt of a ſingle petal, whoſe upper lip is upright, roundiſh, and divided into two ſegments, and the lower into three; the middlemoſt of which is hollowed like a ſpoon, having a double part, and is ſomewhat winged. There are four oblong blue ſtamina, with ſmall dark blue apices. The flower cup is long, ſtreaked, and divided into ſix ſegments, from which the piſtil ariſes, fixed in the back part of the flower like a nail, attended with four embryoes, which turn into as many ſmall, roundiſh, brown ſeeds, contained in a capſula that was the cup of the flower. Hyſſop is propagated either by ſeeds or cuttings, and muſt be ſown in March, on a bed of light ſandy ſoil, and when they are come up they ſhould be tranſplanted out to the places where they are to remain, placing them at leaſt a foot aſunder every way. The cuttings ſhould be planted in April, or May, on a border where they may be defended from the violent heat of the ſun, and being frequently watered they will take root in two months, after which they may be tranſplanted where they are to continue. Hyſſop has an acrid taſte, and a ſtrong aromatic ſmell. It ſtrengthens the ſtomach, helps digeſtion, incides viſcid mucus of the lungs, and promotes expectoration: whence ſome account it a ſpecific in the moiſt aſthma. It is given in infuſion, or decoction, in water, wine, or ale, from half a handful to a handful and a half.

JASMIMUM, *the Jeſſamine tree*, has a pinnated leaf, and the cup of the flower conſiſts of a ſingle leaf divided into five ſegments; the flower alſo conſiſts of a ſingle leaf, in the ſhape of a funnel, and divided into five ſegments, with ſmall apices; the embryo is roundiſh, with a piſtil like a thread, of the length of the ſtamina, with a double apex. The embryo turns to an oval ſmooth berry, divided into two cells, in each of which there is a large oblong oval ſeed, wrapped up in a membrane, convex on one ſide, and flat on the other. It is very common in moſt Engliſh gardens, where it is cultivated for the ſweetneſs of the flowers, and is propagated by laying down the tender branches in the ſpring. In the ſucceeding ſpring, they will be rooted ſtrong enough to be tranſplanted; and it muſt be placed againſt a wall, or pales, where the flexible branches may be ſupported. It was formerly in ſome eſteem for its medicinal virtues, but is now out of uſe.

IBERIS, *Sciatica Creſſes*, whoſe flower conſiſts of four unequal parts, that are vertically oval, blunt, and open, with oblong erect heels, of which the outer ones are by far the greateſt, and the innermoſt leaſt

and bent back. The flower cup has four leaves, vertically oval, concave, open, ſmall, equal, and ſoon fall off; the ſtamina are ſix ſubulated erect filaments, of which the two lateral are the ſhorteſt, and the apices are roundiſh. The germen, or embryo, is roundiſh and flat, and the ſtile, or piſtil, ſingle and ſhort, with a blunt apex, and turns to a ſmall roundiſh flat pod, conſiſting of two cells, in each of which there is an oval ſeed. It has the ſame virtues as water creſſes, and, when bruiſed together with ſalt and hog's-lard, makes an excellent cataplaſm againſt the hyp-gout. It is only to be met with in botanic gardens.

JUGLANS, *the Walnut-tree*, is very large, and ſtands upon many very long roots. The trunk, or ſtem, is very thick, inſomuch that in ſome countries it is three cubits in circumference, with many branches at the top. The bark is thick, of a greeniſh aſh colour, and ſmooth; but, when it grows old, is full of chinks. The wood is well known for making or covering curious cabinets, cheſts of drawers, and the like, and is greatly eſteemed for its beautiful variegations. The leaves are diſpoſed in wings, and there are five, ſix, or ſeven adhering to one rib, conſiſting of conjugations, with a ſingle leaf at the end. At firſt they are tender, reddiſh, and have a ſweet ſmell; but, when they are full grown, they are a palm and a half in length, and almoſt a palm broad, and pointed at both ends, with veins that run from the middle nerve, and are ſmooth, of a beautiful green, with the ſmell of laurel, but much ſtronger, and of an aſtringent taſte. The ſmell of the walnut is at firſt pulpy and white, and of a bitter acrid taſte; but, as it ripens, it becomes woody, and divides into two parts, in which is a kernel with four lobes, and covered with a thin ſkin. The taſte is ſweet and agreeable when freſh; but, when dry, it becomes oily and rancid. The ſkin is bitter, acrid, and when the kernels are freſh may be eaſily taken off. Walnuts are of different ſpecies, as the *largeſt Walnut*, the *thin ſhelled*, the *hard ſhelled*, the *late ripe*, the *black Virginia*, the *black Virginia with long fruit*, the *Hickary*, the *ſhag bark*, the *ſmall Hickary* or *white Virginia*, and the *leaſt Virginia Walnut*. The four firſt ſorts are propagated every where in England, and the firſt and ſecond are preferred for their large nuts. The Virginian ſorts are only rarities, but are worth cultivating for their timber. All ſorts of walnuts, that are propagated for timber, ſhould be ſown in places where they are to remain, but ſuch as are deſigned to produce good fruit, are greatly mended by tranſplantation. The nuts ſhould be preſerved in their outer covers till February, when they ſhould be planted in lines at the diſtance they are intended to remain. When theſe trees are tranſplanted, neither the roots nor branches ſhould be pruned. The beſt ſeaſon for this is as ſoon as the leaves begin to decay, and this may be done till they are eight or ten years old. They delight in a firm, rich, loamy ſoil, or ſuch as is inclinable to chalk or marl. They ſhould be placed forty feet aſunder, when any regard is had to the fruit; but, when for timber, they muſt ſtand near each other, becauſe it promotes their upright growth.

The inner bark of the Walnut tree is a ſtrong vomit, but the catkins are more gentle, and have been given in powder from half a drachm to a drachm. Some account the leaves an excellent cataplaſm againſt the gout, when they are placed while green in a glazed earthen veſſel one layer upon another. The juice of the root is a violent purge, unleſs it proceeds from the wounded root in February, and then it is recommended in chronic diſeaſes, eſpecially in the gout, gravel, and head-ach; for it greatly promotes urine. The green outer rind is aſtringent, and is ſaid by ſome, when recent, to have an emetic faculty. The kernels are beſt while freſh, becauſe when old they grow rancid, as was before obſerved. The membrane, or pith, powdered and given to a drachm, is good in the cholic, and by ſome eſteemed as a ſecret againſt fluxes of the belly.

JUNIPERIS, *the Juniper tree*, is a ſhrub well known in all parts of Europe, and grows in woods and mountainous places. The ſtem riſes ſometimes to the height of a man, but is ſlender, and has many branches, with a rough reddiſh bark. The wood is pretty firm and reddiſh, eſpecially when it is dry, with an agreeable reſinous ſmell. The leaves are very ſharp, exceeding narrow, and ſeldom above an inch in length, but often ſhorter; they are ſtiff, pungent, always green, and ſeveral of them grow together, with ſome diſtance between. The catkins appear in April and May, in the places where the leaves join to the ſtalk, and are a quarter of an inch long, variegated with purple and ſaffron colours; they conſiſt of ſeveral ſcales, whoſe lower part is furniſhed with three or four veſicles, leſs than poppy ſeeds, which are full of a fine golden coloured powder. This is the male flower, but the cup of the female flower is very ſmall, adhering to the embryo, and divided into three parts, and there are three ſtiff ſharp petals. The piſtil is divided into three ſingle ſtyles, with each a ſingle apex; and they turn to a fleſhy roundiſh berry, containing three ſeeds each, convex on one ſide and angular on the other. Some trees produce only the male or female flowers and others both. The berries do not grow ripe till the ſecond year, and there are ſome that are three years old. The berries are reſolving, diſcutient, attenuating, heating, abſtergent, and ſtrengthening. They are good in a cold ſtomach, diſcuſs wind, help digeſtion, promote urine, and eaſe the pains of the cholic. They are likewiſe good againſt coughs, and in the moiſt aſthma; they reſtore the fluidity of the blood, and promote ſweat. The doſe is a drachm, which may be either eaten, or their infuſion may be drank in the manner of tea, before meals, to help digeſtion. Many will eat a pugil at a time, without any manner of harm, and found they have not only brought away gravel but ſmall ſtones.

LACTUCA SATIVA NON CAPITATA, *common garden Lettuce*, has a long thick root with many fibres, and oblong, broad, wrinkled, ſmooth, paliſh green leaves, which are very agreeable while young, but bitteriſh when old. When it ſhoots up to a ſtalk, it is ſtrong, thick, round, and grows to the height of a cubit and a half and upwards. The flowers are collected in a ſort of umbel, and the flower cup is imbricated, conſiſts of many acuminated ſcales, and is of an oblong oval ſhape. The flowers conſiſt of many yellow ſemi-florets, with five very ſhort capillary filaments, on which are cylindraceous tubulated apices. The piſtil is like a thread of the length of the ſtamina, on which are two apices bent backwards, to which ſucceed ſmall ſeeds, ſharp at both ends, furniſhed with down, and of an aſh colour.

LACTUCA SATIVA CAPITATA, *Cabbage Lettuce*, has ſhorter and broader leaves than the former, which are ſoon collected into a round head; the ſeeds are like the former but black. Beſides theſe, there are the *Silicia Lettuce*, the *Dutch brown*, the *Aleppo*, the *imperial*, the *green capuchin*, the *upright white Cos*, the *black Cos*, the *white Cos*, the *red Capuchin*, the *Roman*, the *prince*, the *royal*, and the *Egyptian Cos Lettuce*. The firſt of theſe is commonly ſown for cutting very young, with other ſmall ſallad herbs. They may be ſown any time in the year, but in winter it ſhould be under glaſſes. The *Cabbage Lettuce* may be alſo ſown at different times of the year, particularly in February for the firſt crop, in an open warm ſpot of ground, and when they

they are come up they ſhould be thinned to the diſtance of ten inches every way. The ſeeds, that are ſown for the ſucceeding crop, ſhould be in a ſhady moiſt ſituation, but not under trees. Thoſe for the laſt crop ſhould be ſown in Auguſt, on a good light ſoil, and in a warm ſituation. In the beginning of October, they ſhould be tranſplanted into warm borders, where, if the winter is not very ſevere, they will ſtand very well. Moſt of the other ſorts may be ſown in March, upon a warm light ſoil, and in an open ſituation, and afterwards in April, May, and June; and in Auguſt, thoſe that are intended for the winter, which ſhould be tranſplanted either under glaſſes, or in beds arched over with hoops, in order to be covered over in the winter.

The *Roman Lettuce* has longer and narrower leaves than the two firſt, and not ſo wrinkled, and underneath, on the ſides of the rib, there are ſmall prickles. Some, as theſe lettuces grow, tie the leaves together, by which means they become exceeding white and tender; and then they are thought by many to excel all other kinds. In general lettuces are eaſy of digeſtion, abate the acrimony of the humours, and quench thirſt; for which reaſon they are frequently uſed in the ſummer ſeaſon. Many take them to be anodyne, and to procure ſleep, which is done not by any narcotic quality, but by relaxing the fibres, and temperating the heat of the viſcera. They are good in dry conſtitutions, and help thoſe that are coſtive.

LAPATHUM MAJUS, *ſive* RHABARBARUM MONACHORUM, *Monks Rhubarb*, has a long thick root, from which proceed many fibres, and is brown without, but within of a deep ſaffron colour. The ſtalk, which ſometimes riſes to the height of a man, is reddiſh, ſtreaked, and divided into many branches at the top; the leaves are from a foot to a foot and a half long, and are broad, acuminated, firm, ſmooth, of a darkiſh green, but not hard and ſtiff; the edges are ſometimes a little turned up, but they are even, and have long pedicles. The flowers grow in long rows on the ſtalks, and are like thoſe of ſorrel, to which ſucceed angular ſeeds contained in membranaceous cells, and are like thoſe of the dock; they are ſaid to purge bile gently, to be a powerful aſtringent, and to open obſtructions of the liver; whence the powder or decoction is given in ſome fluxes of the belly. The doſe, in powder, is from a drachm to half an ounce, when it is deſigned to purge.

LAPATHUM SANGUINEUM, *Blood-wort*, is not unlike the garden dock, but may be eaſily diſtinguiſhed from all other docks by its blood-red juice, and by its numerous nerves; the juice firſt tinges the hands with a purple colour, which afterwards changes to blue. The leaves are eaten by ſome after they are boiled, and have likewiſe been preſcribed in emollient and cooling broths. The ſeed is ſtrengthening, aſtringent, and anodyne, and the powder of them is given from half a drachm to a drachm to ſtop uterine fluxes, and thoſe of the belly attended with gripes.

LAPATHUM ROTUNDIFOLIUM, *ſive* LAPATHUM MONTANUM, *baſtard Monks Rhubarb*, has a long branched root, and each of the branches are as thick as a man's thumb; they are wrinkled and fibrous, and of a deep yellow, with a bitter taſte. The ſtalk ſometimes riſes to three cubits high, and is hollow, furrowed, reddiſh, and has many wings. The leaves are like thoſe of burdock, and are remarkably round, ſmooth, and of a yellowiſh green, with a reddiſh ſtreaked pedicle. There are ſeveral flowers placed upon the ſtalks, conſiſting of many yellow ſtamina and apices, with a calyx compoſed of ſix leaves, to which ſucceed triangular reddiſh ſeeds. The root is variegated with yellow and red, like true rhubarb, and ſome pretend it has the ſame virtues, but weaker. Its doſe, in powder, is to two drachms. When the roots are taken freſh out of the ground, and dried in the ſhade, they are uſed in fomentations, liniments, and ointments againſt diſeaſes of the ſkin.

LAPATHUM AQUATICUM, *ſive* HYDROLAPATHUM, *great water Dock*, has a more fibrous root than the former, which is black without, and of the colour of box within. The ſtalks riſe to the height of two or three cubits, and the flowers and ſeeds are like the former, but larger; the leaves are broad, long, and ſomewhat like thoſe of monks rhubarb; but are almoſt a cubit and a half in length, terminating in a ſharp point, with the edges ſlightly curled. It grows in marſhy places, and by the ſides of ditches. The leaves of this plant are ſtyptic and bitteriſh, and the taſte of the root is very bitter. The root is a laxative, opens obſtructions of the viſcera, and is good in diſeaſes of the ſkin. The freſh root is given from an ounce to two ounces in decoction, and in ſubſtance, when dry, from a drachm to two drachms.

LAPATHUM SPINACIA DICTUM, *Spinage*, of which there are three kinds, the *common Spinage*, the *common barren Spinage*, and the *common Spinage with a capſula of the ſeed not prickly*.

The *common Spinage*, or the *common prickly narrow leaved Spinage*, has a ſlender, white, ſingle root, with a few fibres, and the ſtalks, which riſe to the height of a foot, are fiſtulous, round, ſtreaked, divided into wings, and have long pedicles. The leaves at the bottom are ſometimes jagged on both ſides, with ſharp points; but thoſe on the top have only two proceſſes, like ears at the baſe, with a fine ſort of meal thereon. The flowers are placed on the ſtalks from the middle to the top, and are without petals; but they have many ſtamina and ſmall herbaceous, or purpliſh ſmall apices, placed in a cup, conſiſting of four leaves. Thoſe that ariſe from the wings of the leaves, or the female plants, have no petals, but only greeniſh embryoes, with four whitiſh filaments, that turn to a pretty large fruit, or capſula, with prickles adhering thereto. It is planted in gardens.

Common ſmooth ſeeded Spinage, with broader leaves, has much larger leaves than the male and barren or female kinds, and are alſo rounder, and the capſula of the ſeeds is quite ſmooth and of an aſh colour. Theſe are common kitchen herbs throughout Europe. In general, they are ſaid to temperate acrid bilious humours in the firſt paſſages; but, as they are watery, ſome correct them with ſalt, pepper, and other ſpices. They do not yield much nouriſhment, but are not unwholeſome, and generally keep the body open. The ſeeds of the male and barren kinds ſhould be ſown in an open ſpot of ground in the beginning of Auguſt, when it is likely to rain; when the plants are come up, they ſhould be thinned, leaving them three or four inches aſunder; and this ſhould always be done in dry weather. In October they will be fit for uſe, and then you ſhould only crop off the largeſt leaves, leaving thoſe in the center of the plants to grow bigger. Thus you may continue cropping it all the winter and ſpring, till the young ſpinage, ſown in the ſpring, is large enough for uſe, which is commonly in April. The other ſort is likewiſe to be ſown in an open ſpot of ground. The plants ſhould be left about three inches aſunder, and, when they are grown large enough to meet, part may be taken up for uſe, that ſo the plants, being thinned, may have room to ſpread; this may be repeated twice, and at the laſt, they ſhould be eight or ten inches aſunder.

LAVANDULA, LATIFOLIA, *greater*, or *broad leaved Lavender*, has a woody root divided into fibres, and the plant conſiſts of many thick, ſlender, quadrangular, geniculated branches, that riſe to the height of a cubit and a half, or two cubits. The lower

lower leaves are thickly placed, and irregular; but the upper are ſet by pairs alternately, and are fleſhy, hoary, and oblong, with a nerve running along the middle; as alſo a ſtrong agreeable ſmell, and a bitteriſh taſte. It is a verticillated plant, and the flowers grow on the tops of the branches in ſpikes, which are blue, labiated, and conſiſt of a ſingle petal; the upper lip is upright, roundiſh, and cloven into two parts, and the lower into three, that are almoſt equal. The calyx is oblong and narrow, and from it riſes a piſtil fixed in the back part of the flower like a nail, and attended with four embryoes, that turn to as many ſeeds, contained in a capſula, that was the cup of the flower.

LAVANDULA ANGUSTIFOLIA, *narrow leaved Lavender*, is in all reſpects like the former, only it is leſs, ſhorter, and the leaves are leſſer, narrower, and not ſo long or white, nor is the ſmell ſo ſtrong; but the flowers are larger. Sometimes they both vary in having white flowers. They are propagated by cuttings or ſlips, and the beſt ſeaſon is in the latter end of March, when they ſhould be planted in a ſhady ſituation; or at leaſt be ſhaded with mats till they have taken root; after which they may be expoſed to the ſun, and, when they are ſtrong enough, may be removed to the places where they are deſigned to remain. They delight in a dry gravelly ſoil, where they will endure our ſevereſt winters. Lavender is cephalic, nervous, and uterine; for by its aromatic, ſubtile, acrid particles, it ſtimulates the nervous fibres to an oſcillation, and reſtores their tone; it diſſolves thick humours, and renders them fit for motion. It is good in catarrhs, the apoplexy, palſy, ſpaſms, the vertigo, lethargy, and trembling of the limbs. The doſe of the flowers, or ſeeds, is from a ſcruple to a drachm; or the infuſion may be drank in the ſame manner as tea. The doſe of the conſerve of the flowers is half an ounce, and of the eſſential oil, from two drops to ſix, on ſugar.

LAUREOLA MAS, *Spurge Laurel*, has a tough, thick, long, woody root, divided into ſeveral branches, with ſeveral aſh coloured or whitiſh ſtems, riſing to the height of two cubits, with leaves like thoſe of laurel, but leſs, or ſomewhat like thoſe of myrtle, they are blackiſh, thick, ſmooth, ſhining, and pointed at both ends, and are thickiſh near the ends of the branches. It is an ever-green, and the flowers that grow on the top, are of a greeniſh yellow, conſiſting of a ſingle petal, that is fibrous on the back part, but before divided into four acuminated ſegments; there is no cup, but there is a piſtil that turns to a berry, in the ſhape of an olive, though much leſs. It is at firſt green, but black when ripe, and contains a hard oblong ſeed, full of a white pulp. The leaves, fruit, and bark, are very acrimonious, biting the tongue, as it were ſetting them on fire.

LAURUS VULGARIS, the *Bay-tree*, in hot countries, grows to a conſiderable height, and has a ſmooth trunk without knobs, and long branches; the leaves are long, ſharp, hard, nervous, ſmooth, but have little juice, though they have a fine ſmell, and an acrid, bitter, aſtringent taſte. The flower conſiſts of a ſingle petal, ſhaped like a funnel, and divided into four or five ſegments. The male flowers, which are produced on ſeparate trees from the female, have eight ſtamina, which are branched into arms; and the embryo of the female flowers becomes a berry, incloſing a ſingle ſeed within a horny ſhell, which is covered with a ſkin. Beſides this, there are ſeveral ſorts of Bay-trees, that are cultivated in gardens, moſt of which have been lately brought from diſtant countries. They are propagated either from the ſeeds, or by laying down the tender branches, which will take root in a year's time, and may then be taken off, and tranſplanted into a nurſery, or the places where they deſign to remain. The leaves are aromatic, bitteriſh, with ſomewhat of an aſtringency, and they are heating, reſolvent, ſtrengthen the ſtomach, help digeſtion, and diſcuſs wind; for theſe purpoſes, the infuſion may be drank as tea, or the powder may be given to a drachm. The berries are more heating than the leaves, and two ſcruples in infuſion is a doſe; but their principal uſe in the preſent practice is in clyſters, and the leaves as a fomentation.

LEPIDIUM LATIFOLIUM, *common broad Dittander*, or *pepper wort*, has a white root, as thick as one's finger, that creeps in the ground, and has an acrid hot taſte, that immediately vaniſhes. It has ſeveral ſtalks, two cubits in height, that are round, ſmooth, branched, and full of pith; it is covered with a blueiſh meal, which may be eaſily wiped off. The leaves are long, broad pointed, and like thoſe of the citron-tree, but larger and ſofter, of a darkiſh green, and ſerrated on the edges. The flowers grow on the tops of the branches, and are ſmall in proportion to the ſize of the plant; they conſiſt of four petals, placed in the form of a croſs; and the piſtil, that riſes out of the calyx, turns into a very ſmall flat fruit, with a ſharp point, and a partition in the middle, that divides into two cells, full of ſmall, oblong, red ſeeds. The whole plant has an acrid taſte, and grows wild in ſome parts of England; but it is generally cultivated in gardens for uſe. It is eaſily propagated, by planting ſmall bits of the root, either in ſpring or autumn; but it ſhould be placed in ſome corner of the garden, becauſe the root will ſpread and over-run the ground. This plant incides groſs humours, opens obſtructions of the liver and ſpleen, and is accounted by ſome a great antiſcorbutic. When the leaves are eaten faſting in the morning, they excite the appetite, and help digeſtion.

LEVISTICUM, *Lovage*, has a large fleſhy root, blackiſh without, and white within, and the ſtalks often riſe to the height of a man; theſe are thick, light, ſtreaked, and divided into many branches. The leaves are like thoſe of parſley, but larger every way, and they are ſmooth, ſhining, of a dark green colour, with a ſtrong ſmell. The flowers grow in umbels on the tops of the branches, and are roſaceous, conſiſting of five yellow petals, or upwards. The calyx turns to a fruit, compoſed of two oblong, thick ſeeds, gibbous and ſtreaked on one ſide, and on the other flat, and of a dirty colour. Lovage is ſaid to be alexipharmic, carminative, diuretic, urine, and vulnerary. It ſtrengthens the ſtomach, helps digeſtion, diſcuſſes wind, attenuates groſs humours, eaſes pains of the cholic, and is good in the aſthma. It is looked upon as a ſpecific againſt the jaundice, eſpecially when it proceeds from a clammy bile. The doſe of the root, in powder, is from half a drachm to a drachm, and of the ſeed from a ſcruple to half a drachm.

LIGUSTRUM, *Privet*, is a ſhrub divided into a great number of branches, covered with an aſh coloured bark, and the wood is whitiſh and hard. The leaves grow by pairs oppoſite to each other, and are oblong, and narrow like thoſe of willow; but they are ſhorter, thicker, ſmooth, ſhining, and of a blackiſh-green colour. The flowers grow on the top in bunches, and conſiſt of a ſingle petal in the ſhape of a funnel, divided on the top into five ſegments. They are white, have a ſweet ſmell, and in the middle there are placed yellowiſh green apices, with a green piſtil that turns to a ſoft and almoſt globous berry, of the ſize of juniper berries, and are blackiſh when ripe, and full of juice. They contain generally four globous ſeeds, with a bay coloured ſkin, and a whitiſh pulp. It is com-

mon in hedges in moſt parts of England, and generally grows to about eight or ten feet high. The leaves are bitter and ſtyptic, and therefore they, as well as the flowers, are recommended by ſome againſt hæmorrhages.

LILIUM ALBUM, the *white Lily*, has a bulbous root, conſiſting of ſeveral fleſhy ſcales, united together, and fixed to an axis, under which there are many fibres; the ſtalk is upright, and ſometimes riſes to the height of a cubit and a half; it is ſingle, brown, and at the bottom there are oblong, broadiſh, fleſhy, ſmooth leaves, without a pedicle, of a ſhining light green colour, but towards the top they become gradually leſs and narrow, and, if they are rubbed between the fingers, they have a ſmell like boiled mutton. There are ſeveral flowers placed on the top, that do not grow at the ſame time; they are compoſed of ſix leaves, in ſhape ſomewhat like a bell, and in the middle there is a longiſh piſtil terminating in three points, of a greeniſh white colour; the ſtamina are alſo ſix in number, and of the ſame colour with the petals, with apices of a ſaffron colour. The piſtil turns to an oblong triangular fruit, divided into three cells full of reddiſh ſeeds with borders, and lie upon each other in a double row. They are cultivated in gardens for the ſake of their beauty and ſweet ſmell. There are many other kinds of lilies, all which may be propagated by ſowing their ſeeds in ſquare boxes about ſix inches deep, with holes at the bottom, and filled with light, freſh, ſandy earth. They are to be ſown ſoon after they are ripe, pretty thick, and muſt be covered with light ſifted earth about half an inch; then the boxes are to be placed where they have the morning ſun only, and muſt be watered in dry weather. They muſt continue thus till October, when they muſt be removed to places where they may have as much ſun as poſſible, and yet ſcreened from the north and eaſt winds during the winter; but in the ſpring, about the middle of April, they muſt be removed to their former poſition; for then the young plants will appear above ground. Here they muſt remain till Auguſt, when they muſt be taken out of the boxes with the earth, and planted in beds of freſh light earth; that is, the ſmall bulbs, together with the earth, muſt be ſtrewed over the beds, covering them about half an inch thick with fine ſifted earth, obſerving to water them in hot and dry ſeaſons. They muſt be ſhaded in the middle of the day, and refreſhed now and then with water. In the ſpring, when the hard froſts are over, the ſurface of the beds muſt be cleared, and a little freſh earth ſifted thereon; but this ſhould not be deferred too long, leſt the ſhoots ſhould be coming up and broken by this means. When the leaves are decayed, you ſhould ſtir the ſurface of the beds again, to prevent the weeds from growing, and in September you muſt ſift ſome more freſh earth, to the thickneſs of half an inch. In September following, they will require to be tranſplanted to a greater diſtance in moiſt weather.

The flowers are uſed in emollient cataplaſms, and the oil made by inſolation is of common uſe in pains and tumours of all kinds. The roots are alſo in great requeſt for ſoftening and ripening tumours, and are particularly recommended for burns and bruiſes, when roaſted under the aſhes.

LILIUM CONVALIUM, *Lily of the Valley*, has a ſlender, white, fibrous root, creeping near the top of the ground, and produces two or three leaves, a palm and a half in length, two inches broad, ſhining, of a light green, nervous, and terminating in a point; among theſe the ſtalk ariſes to a ſpan in height, which is ſlender, angular, naked, and from the middle of which, and at the top, there proceeds a long ſeries of flowers, growing at ſome diſtance from each other, but almoſt all looking the ſame way; they have very ſhort pendulous pedicles, and conſiſt of a ſingle white petal, in the ſhape of a bell, divided into ſix ſegments, with as many ſtamina, of a greeniſh yellow, and adhering to the bottom; the piſtil is triangular, and turns to a ſpherical, ſoft, red fruit, full of pulp, and three hard, horny, bitteriſh ſeeds. The flowers only are in uſe, which have a very pleaſant agreeable ſmell. It increaſes very faſt by its creeping roots, for which reaſon it may be propagated in great plenty, by parting the roots in October; they muſt be planted in a ſhady ſituation, and in a moiſt ſoil, placing them near a foot aſunder. The flowers have a bitteriſh taſte, and when dried, powdered, and ſnuffed up the noſe, they occaſion ſneezing. It is accounted a cephalic nervous remedy, and to be good in all diſeaſes of the head and nerves. The doſe of the powder is a drachm, and of the conſerve half an ounce.

LINUM VULGARE, *common Flax*, has a ſlender root, with a few fibres, and a round ſtalk, that is generally ſingle, light, ſmooth, and grows to the height of a cubit, or a cubit and a half. The leaves are acuminated, of the breadth of a ſtraw, and about two inches long; they are alternately placed on the ſtalk, and are ſoft and ſmooth. The flowers grow on the tops of the branches, on ſlender longiſh pedicles, and are of a blue colour; they conſiſt of five petals, and when expanded, are in the ſhape of a clove gilly-flower. The flower cup is tubulous, conſiſting of a ſingle leaf, and is divided into five parts at the top. The piſtil, which riſes from the center of the flower cup, turns into a globous fruit, that is ſlightly acuminated, and is compoſed of ſeveral cells, opening inward, full of flattiſh oval ſeeds, blunt at one end, and ſharp at the other; they are ſmooth, ſhining, and of a yellowiſh purple colour. It is cultivated for uſe in many parts of Europe, and is accounted, with good management, a very advantageous plant. The ſeeds are mucilaginous, abate the acrimony of the fluids, and are greatly recommended againſt heat of urine. The expreſſed oil looſens the belly, appeaſes coughs, and promotes expectoration; it is accounted a ſpecific againſt the pleuriſy, when given from two to four ounces every fourth or ſixth hour; but it muſt be freſh, and have a ſweet taſte. Externally it is emollient, and relaxes the contractions of the tendons. It is called linſeed oil, and its uſe in painting is very well known.

LITHOSPERMUM, *Cromwell*, has a woody fibrous root, about as thick as one's thumb, with upright, ſtiff, round, rough, branched ſtalks, that riſe to a cubit and a half in length; there are many leaves, placed alternately, that are two or three inches long, ſharp, rough, without pedicles, and of a blackiſh green colour. The flowers proceed from the places where the leaves join to the ſtalk, and conſiſt of a ſingle white petal, in the form of a funnel, divided into five blunt ſegments, with a hairy calyx, conſiſting of a ſingle leaf, cut almoſt to the bottom in five narrow hairy ſegments; the piſtil is green, and attended with four embryoes, that turn to as many roundiſh, hard, ſmooth, ſhining ſeeds, of the colour and ſhape of ſmall pearls. It grows in ſhady lanes, and uncultivated places, in various parts of England. The ſeed is accounted a great diuretic, and a gentle anodyne; for which reaſon it is recommended to promote urine, and expel gravel. The doſe is to two drachms.

LUJULA, *wood Sorrel*, is a low plant, with a thickiſh, ſcaly, reddiſh, white root, from whence proceed weak, ſlender, brown pedicles, a palm in length, on which are three leaves, that are thin, broader than long, ſmooth, in the ſhape of a heart, and of a pale green colour. Among theſe there

there are other pedicles, each ſuſtaining a ſingle flower, that conſiſts of one petal, in the ſhape of a bell, and divided into five ſegments; it is white, open, tranſparent, and the calyx is divided into five parts, with a piſtil fixed in the loweſt part of the flower like a nail, that turns to a cylindraceous five cornered fruit, divided into five cells, containing ſhining reddiſh ſeeds, which, when ripe, burſt out with violence. It grows in moſt parts of England, and has much the ſame virtues as common ſorrel. It quenches thirſt, mitigates heat, and reſolves viſcid blood; whence it is ſaid to cool the liver, and is accounted a good antiſcorbutic. The doſe of the juice is an ounce.

LUPINUS, FLORE ALBO, *the white Lupine*, has a ſingle, woody, fibrous root, and a ſtalk that riſes to a cubit and a half in height, which is pretty thick, upright, round, a little downy, and full of pith. The flowers, which grow on the top, are papilionaceous, and appear in ſpikes at the top of the branches, on ſhort pedicles. The piſtil, which riſes from the calyx, turns to a thick, broad, flat pod, three inches long, with a yellowiſh colour, and a little hairy on the outſide, but ſmooth within, and contains pretty large, roundiſh, flat ſeeds, white without, but yellowiſh within, and very bitter. The leaves are irregularly placed on pedicles, two or three inches long, and conſiſt generally of ſeven oblong, narrow ſegments, proceeding from the ſame point of the pedicle, like thoſe of cinque-foil. Lupines are uſed externally, in decoctions, againſt diſeaſes of the ſkin; and their meal is mixed in cataplaſms, being reckoned among the four reſolvent meals.

LUPULUS, *the Hop-plant*, has a creeping root, with ſuch weak ſtalks, that they could not ſupport themſelves without twiſting about whatever is near them; they are exceeding long, rough, angular, hairy, and hollow; the leaves proceed from the ſtalks by pairs, and are placed over againſt each other; they are like thoſe of the mulberry-tree, and terminate in points; they are generally divided into three, and ſometimes into five ſegments, and are ſerrated on the edges. That ſort, which bears flowers, has no ſeeds, and that, which has ſeeds, has no ſtamina. The male flowers conſiſts of a calyx divided into five parts, and ſurrounds the ſtamina, but there are no petals; the flowers of the female plants are collected into ſcaly heads, which grow in bunches, and have ſome reſemblance to pine-apples; they are compoſed of ſeveral membranaceous looſe ſcales, of a yellowiſh green colour, and adhere to a common axis; the ſeeds are ſmall, flat, and red, and have the ſmell of garlick. The people that cultivate hops reckon three varieties, as the *long ſquare garlick Hop*, *the long white Hop*, *and the oval Hop*, all which are cultivated in England, and particularly in Kent, where they account new land beſt for their growth. The firſt ſhoots of hops, or rather their heads, are commonly called hop-tops, and are by ſome accounted not inferior to aſparagus. They gently looſen the belly, and are good in obſtructions of the viſcera; as for the uſe of hops, it is very well known throughout the world, it being brewed in malt liquors, to prevent their growing ſour.

MAJORANA, *ſweet Marjoram*, has ſlender roots, and the ſtalks riſe to a palm in height, and upwards; they are ſlender, woody, often ſquare, a little hairy, and reddiſh, about which the leaves are placed oppoſite to each other. It is a very verticillated plant, and the flowers grow on the tops of the branches, and conſiſt of a ſingle, labiated, whitiſh petal, whoſe upper lip is upright, roundiſh, and divided into two parts, and the lower into three. The flowers are collected into thick, ſhort, round heads, and proceed from a four-fold order of leaves, placed like ſcales. It is cultivated in gardens, and is an annual plant; for which reaſon the ſeeds muſt be ſown every year, which are brought from the ſouthern parts of France, where it grows wild. They muſt be ſown in the beginning of April, in a dry warm ſpot of ground, and in June the plants will be ſtrong enough to be removed into beds of rich light earth, where they are to be placed four inches diſtant from each other; they will flower in the beginning of Auguſt, and then is the time to pull them up for medicinal uſe.

MAJORANA TENUIFOLIA, *gentle Marjoram*, differs only from the former, in having more ſlender, and fragrant leaves. They both conſiſt of fine oleous, aromatic, active particles, and are uſed as pot herbs, and ſometimes in ſallads, to promote digeſtion, and to diſcuſs wind. They attenuate groſs viſcid humours, excite the ſluggiſh, languid oſcillations of the fibres, and open the pores of the brain and nerves, upon which account it is good in cold diſeaſes of the head, and trembling of the joints. A ſcruple, or half a drachm of the powder, mixed with a proper conſerve, and taken every morning, has been greatly commended in the epilepſy; it is alſo an ingredient of the cephalic ſnuffs, becauſe it is ſaid to purge the head.

MALVA VULGARIS, *common Mallows*, has a ſingle white root, with a few fibres, and a ſtalk that riſes to a cubit and a half in height, and upwards; many of theſe proceed from the ſame root, and are round, hairy, branched, and full of pith. The leaves grow ſingle about the ſtalk on long pedicles, and are roundiſh and jagged on the edges, with a little down, are of a blackiſh green colour, and crenated on the edges. The flowers proceed from the places where the pedicles of the leaves join to the ſtalk; they are large, in the ſhape of a bell, and conſiſt of a ſingle petal, divided into five ſegments, in the ſhape of hearts; they are purpliſh, and ſtreaked with deep purple lines, but are ſometimes variegated with white. From the bottom of the flower proceeds a tube, in the ſhape of a pyramid, on which are purpliſh ſtamina. It has a double calyx, the innermoſt of which is divided into five parts, and the outermoſt into three. The piſtil ariſes from the bottom of the calyx; it is placed in the tube, and turns to a flat round cake, ſomewhat in the form of a cheeſe; for which reaſon they are commonly called cheeſe-cakes by children. They contain a great number of ſeeds, in the ſhape of kidneys, which are diſpoſed round an axis, in ſuch a manner, that they appear to be very artificially jointed. *Mallows* were formerly uſed for food; but is now only in requeſt on account of its medicinal virtues, for it is an emollient, and abates the ſharpneſs of urine. It is alſo uſed in emollient cataplaſms.

MALUS SATIVA, *the Apple-tree*, grows to a conſiderable ſize, and the branches are ſpreading, but more depreſſed than thoſe of the pear-tree. The flowers conſiſt of five leaves, which expand in the form of a roſe, with yellow apices in the middle, and a green calyx, divided into five parts, which turns to a fleſhy roundiſh fruit, generally umbilicated at each end; however, they are of different ſizes and ſhapes, according to their different kinds, which are generally ſo well known, that they need no deſcription. The firſt apple which is brought to market is the codlin, and the next is the margaret-apple, which is not ſo long as the codlin, and the ſide next the ſun changes to a faint red when ripe; but the other ſide is of a pale green. This fruit is firm, and has a pleaſant taſte, but does not keep long. The ſummer pearmain is an oblong fruit, ſtriped with red next the ſun, and the fleſh is ſoft, and grows mealy in a ſhort time. The Kentiſh fill-baſket is of a large ſize, is of a ſomewhat longer ſhape than a codlin, and ripens a little later. Loan's pearmain is a beautiful fruit, and of a fine red next the ſun; the fleſh is vinous, but ſoon grows mealy.

The QUINCE APPLE is of the ſize of a golden pippin, but ſhaped like a quince, eſpecially towards the ſtalk; the ſide next the ſun is of a ruſſet colour, but the other ſide is inclining to yellow. It is an excellent apple, but will not keep above three weeks in September. The golden rennet ripens about Michaelmas, and continues to be a good fruit about a month. The aromatic pippin is of the ſize of a nonpareil, but a little longer, and the ſide next the ſun is of a bright ruſſet colour. It ripens in October. The winter pearmain is rather long than round, of a fine red next the ſun, and ſtriped with the ſame colour on the other ſide; the fleſh is juicy, but it is not a good eating apple. The Kentiſh pippin is large and handſome, and of a pale green colour. It is a very good kitchen fruit, and will keep till February. The Holland pippin is larger than the former and of a darker green. It will keep longer than the former. The monſtrous rennet is very large, of an oblong ſhape, reddiſh towards the ſun, and of a dark green elſewhere; it is of no great value. The embroidered apple is pretty large, with red broad ſtripes, from whence it has its name; it is a tolerable kitchen apple. The royal ruſſet is of a deep ruſſet colour, and is large, and of an oblong ſhape, but broad towards the baſe, and the fleſh is a little yellowiſh. It will continue good from October to April, and is the beſt of all kitchen apples. Wheeler's ruſſet is of a light ruſſet colour next the ſun, and of a pale yellow on the other ſide. The ſize is middling, the fleſh firm, and has a quick, tartiſh taſte; it will keep a long while. Pile's ruſſet is oval, and of a ruſſet colour next the ſun, but of a dark green on the other ſide; it is a good baking apple, and will keep ſound till April. The nonpareil is very well known, but there is another apple generally ſold for it, that is a larger fruit, and more inclining to yellow. It is ripe earlier, ſooner gone, and is not ſo flat as the true nonpareil; which laſt is not ripe before Chriſtmas, and will keep good till May. The golden pippin is peculiar to England, for it will not ſucceed well in other countries. It is an excellent apple, and would be ſtill better, if proper care was taken in its cultivation. There are a great many other ſorts of apples, which have no particular names, except ſuch as ſerve for making cyder; the redſtreak, the whitſour, the Hertfordſhire under leaf, the John apple, the everlaſting hanger, and the gennet moil. They are all propagated by grafting or budding upon ſtocks of the ſame kind. Apples in general are uſed for eating and baking; but, as for their medicinal virtues, they are ſcarcely worth mentioning, though they are ſaid to temperate the bile, and to be good in fevers to allay thirſt. Some pretend they are excellent pectorals, and will appeaſe coughs; but this may be doubted.

MALUS GRANATA, *ſive* PUNICA, *the Pomegranate*, is a low tree, or rather a ſhrub, with ſlender angular branches, beſet with long thorns or prickles. The leaves are like thoſe of the myrtle tree, or olive, only not ſo ſharp, and are of a ſhining green, with reddiſh pedicles and veins. The flowers are roſaceous, conſiſting of five petals of a red or ſcarlet colour, in the middle of which there are many ſtamina, with their apices, and the calyx is alſo red, above an inch long, in the form of a bell, and divided into five pointed jaggs, which, after it is turned to a fruit, are placed round the navel at the top. Pomegranates are of various ſizes, ſome being as big as large apples. The rind is pretty thick, hard, and brittle; before it is ripe it is green, and ſmooth, but afterwards reddiſh and wrinkled, and laſt of all it becomes of a bay colour, and yellowiſh within, with an aſtringent taſte; it is full of ſeeds diſpoſed in various cells, and the pulp has a ſweetiſh vinous flavour; though it is ſometimes acid. There are ſeveral kinds, as the common pomegranate, the ſweet, the wild, the double flowered, and the American double pomegranate. The firſt and ſecond of theſe are hardy enough to reſiſt the ſevereſt cold of our climate, in the open air; and, if planted againſt warm walls, the firſt ſort will often produce fruit, which in warm ſeaſons will ripen tolerably well; but they are ſeldom well taſted in England. Theſe plants may be eaſily propagated, by laying down their branches in the ſpring, which in one year's time will take good root, and may then be tranſplanted where they deſign to remain; and the beſt ſeaſon for this is the ſpring, juſt before they begin to ſhoot. The flowers always proceed from the extremity of the branches which are produced the ſame year, for which reaſon all the weak branches of the former year ſhould be cut out, and the ſtronger ſhould be lengthened according to their ſtrength. The beſt time for this is the beginning of October.

MALICORIUM, *or the rind of the Pomegranate*, has a bitteriſh auſtere taſte, is very aſtringent, and will ſupply the place of oak bark, for tanning of leather, as well as of galls for the making of ink. It is good in a diarrhœa, and all fluxes of the belly whatever, as well as in hemorrhages. It ſtrengthens the tone of the parts, and ſometimes proves an aperient as well as an aſtringent. The doſe, in powder, is from half a drachm to a drachm, and in decoction to half an ounce.

BALAUSTIA, *Balauſtines*, are the flowers of all ſorts of pomegranates, with their flower-cups; but thoſe of the double ſort are generally choſen, becauſe they are large, and have a great number of petals. The cup is not ſo long as in the firſt ſort; it is however more flat and broad, and the colour is of a yellow purple. They are aſtringent, but not ſo much as the rind, and therefore they have been in frequent uſe in all ſorts of fluxes whatever; but they are ſeldom met with in extemporaneous preſcriptions, though often in ſhop medicines. The doſe, in powder, is to a drachm, and to half an ounce in decoction.

MALUS PERSICA VULGARIS, *the common Peach tree*, riſes to a moderate height, and has a pretty thick ſtem, with many brittle branches, and a reddiſh and browniſh bark. The leaves are thin, oblong, acuminated, crenated, and like thoſe of the almond tree; but larger, and have a bitter taſte, like thoſe of peach kernels, though not ſo pleaſant. The flowers appear in the beginning of the ſpring, before the leaves, and without pedicles; for they adhere to the tubercles of the branches, and are roſaceous, conſiſting of five broad petals, of a light reddiſh colour, and in the middle there are many longiſh ſtamina, that are either purple or white, with a piſtil of the ſame length, that proceeds from a reddiſh calyx, divided into five acute ſegments, and turns to a fruit that is almoſt globous, though a little flattiſh on one ſide, and is furrowed according to the length, and covered with a thick, ſoft, whitiſh down, in many of the ſpecies; but ſome are ſmooth, of a yellowiſh herbaceous colour, and theſe are commonly called Nectarines, which contain a woody, oblong, oval ſtone, conſiſting of two valves, deeply furrowed, and the pulp in ſome adhere very obſtinately thereto, but in others it readily parts from it. When the bark is wounded, a gum will proceed from it like the plumb tree gum.

Some Peach trees are cultivated for the beauty of their flowers, as the peach tree with double flowers, the dwarf peach tree with ſingle flowers, and the double flowering dwarf peach tree, though ſome place theſe two laſt among the almonds. The peach trees, that are cultivated for their fruit, are the white nutmeg peach, which has ſerrated leaves, and large open flowers, but the fruit is ſmall and white, as is alſo the pulp at the ſtone, from which it

it eaſily parts. It is eſteemed for being the ſooneſt ripe.

The *early purple* PEACH TREE has leaves even at the edges, and the flowers are large and open; the fruit is large, round, and of a fine red colour, and the fleſh is white except at the ſtone, where it is very red. It is full of juice of a rich vinous flavour, and is an excellent peach; it is ripe towards the latter end of Auguſt.

The *large French Mignon* PEACH TREE has leaves that are even at the edges, and the flowers are large and open; the fruit is a little oblong, and has generally a ſwelling on one ſide. It has a fine colour, and the juice is very ſweet, with a high flavour; the fleſh is white, but very red at the ſtone, which is ſmall; it is ripe towards the end of Auguſt. It is ſeparated eaſily from the ſtone, and is one of the beſt ſorts.

The *Belle Chevreuſe* PEACH TREE has ſmooth leaves, and the flowers are ſmall and contracted; the fruit is of a middling ſize, a little oblong, and of a fine red; the fleſh is white, but very red at the ſtone, from which it eaſily parts; its juice is ſweetiſh and rich, and it ripens in the beginning of September.

The *red Magdalen* PEACH TREE has deeply ſerrated leaves, with large open flowers, and the fruit is large and round, and of a fine red; the fleſh is white, but very red at the ſtone, from which it readily parts. The juice is ſweetiſh, and has a very fine flavour; it is ripe at the beginning of September, and is one of the beſt peaches.

The *Chancellor* PEACH TREE has leaves that are even at the edges, and has ſmall contracted flowers; the fruit is ſhaped ſomewhat like the belle chevreuſe, but is rounder, with fleſh that is white, and melts in the mouth; it parts freely from the ſtone, where it is of a fine red. The ſkin is very thin, and the juice rich; it ripens in the beginning of September, and is one of the beſt ſort.

The BELLEGARD has leaves that are even at the edges, with ſmall contracted flowers; but the fruit is very large and round, and is of a deep purple colour, next the ſun; the fleſh is white, melts in the mouth, and parts readily from the ſtone, where it is of a deep red; the juice is very rich. It ripens in the middle of September, and is an excellent peach.

The *Bourdine* PEACH TREE has leaves that are even at the edges, with ſmall contracted flowers, and large round fruit, of a fine red colour next the ſun; the fleſh is white, melts in the mouth, and parts readily from the ſtone, where it is of a fine red; the juice is vinous and rich, and ripens in the middle of September.

The *Roſanna* PEACH TREE has leaves that are even at the edges, with ſmall contracted flowers, and large fruit; the fleſh is yellow, and parts readily from the ſtone, where it is red. The juice is rich and vinous, and it ripens in the middle of September.

The *Rambouillet* PEACH TREE has leaves that are ſmooth at the edges, with large open flowers, and fruit of a middling ſize, rather round than long, and divided by a deep furrow in the middle; it is of a fine red colour next the ſun, and of a light yellow next the wall. The fleſh is of a bright yellow, melts in the mouth, and parts readily from the ſtone, where it is of a deep red, and the juice is rich, with a vinous flavour; it ripens at the latter end of September.

The *Nivette* PEACH TREE has ſerrated leaves, with ſmall contracted flowers, and large fruit, ſomewhat longer than round, of a bright red colour next the ſun, and of a pale yellow on the other ſide; the fleſh melts in the mouth, is full of a rich juice, and is very red at the ſtone, from which it parts. It ripens towards the latter end of September.

The *bloody* PEACH TREE bears fruit of a middling ſize, of a deep red next the ſun, and fleſh that is of a deep red to the ſtone; but it ſeldom becomes quite ripe in England. Beſides theſe, there are a very great variety of other ſpecies of peaches; but as theſe we have here deſcribed are the moſt uſual ſorts planted, we ſhall not tire the reader with a long catalogue of names, which he may never have occaſion to peruſe. A good peach ought to have a firm fleſh, a thin ſkin, of a fine red colour next the ſun, and of a yellowiſh caſt next the wall; the fleſh ſhould be of a yellowiſh colour, full of juice, and high flavoured, with a ſmall ſtone, and the pulp or fleſh very thick.

All Peach trees have been originally obtained from the ſtones, which ſhould be planted in autumn, on a bed of light dry earth, about three inches deep, and four inches aſunder; in the winter the beds ſhould be covered to protect them from the froſt, and in the ſpring, when the plants come up, they ſhould be carefully cleared from the weeds, as well as all the ſummer obſerving to water them when the weather is dry. They ſhould remain here till the following ſpring, when they ſhould be carefully taken up, without breaking the tender roots, and tranſplanted into a nurſery in rows, three feet aſunder, and eighteen inches diſtant plant from plant in the rows, obſerving to lay a little mud about the roots; they muſt alſo be watered in dry weather once a week, till they have taken root. Here they may continue two or three years, till they are tranſplanted, where they are to remain. When this is done, the downright roots muſt be pruned pretty ſhort, and the bruiſed parts cut off, as well as the ſmall fibres; but the heads ſhould not be meddled with. Theſe are generally deſigned for ſtandards. As for the planting, budding, and management of peach trees that are to be placed againſt walls, we muſt refer the reader to books entirely devoted to the uſe of the common gardener, as it would take up more room than this treatiſe will allow.

The NECTARINES are properly peaches, though generally diſtinguiſhed from them, of which the following are the moſt remarkable ſorts; and indeed it may be doubted whether there are really any more or not.

Fairchild's early NECTARINE TREE produces fruit the ſooneſt ripe of any we have; it is ſmall and round, about the ſize of a nutmeg peach, and of a beautiful red; it has a very good flavour, and ripens towards the end of July.

The *Elruge* NECTARINE TREE has ſerrated leaves, with ſmall flowers of a dark red or purple next the ſun; but of a pale yellow or greeniſh colour towards the wall; it parts from the ſtone, melts in the mouth, and is ripe in the beginning of Auguſt.

The *Newington* NECTARINE TREE has ſerrated leaves, with large open flowers, and a fair large fruit, of a beautiful red next the ſun, but of a bright yellow towards the wall; it has a very rich juice, and the pulp or fleſh adheres cloſely to the ſtone, where it is of a deep red. It ripens in the middle of Auguſt, and has a better flavour than any of the reſt.

The *ſcarlet* NECTARINE TREE bears fruit a little leſs than the former, of a fine red or ſcarlet next the ſun, but of a paler red towards the wall; it ripens in the beginning of Auguſt.

The *Brugnon* or *Italian* NECTARINE TREE has leaves that are even on the edges, and ſmall flowers, with a fair large fruit, of a deep red next the ſun, but yellowiſh towards the wall; the pulp is firm, of a rich flavour, and cloſely adheres to the ſtone, where it

it is very red; it ripens towards the latter end of Auguſt.

The *Roman red* NECTARINE TREE has leaves that are even at the edge, and flowers with large fair fruit, of a deep red or purple colour next the ſun, but has a yellowiſh caſt towards the wall; the pulp is firm, of a rich flavour, and adheres cloſely to the ſtone, where it is very red. It ripens towards the latter end of Auguſt.

The *Murrey* NECTARINE TREE bears a middle ſized fruit, of a deep red next the ſun, but of a yellowiſh green towards the wall; it has a pretty good flavour, and ripens towards the end of Auguſt.

The *golden* NECTARINE TREE bears a handſome fruit, of a light red next the ſun, and of a bright yellow towards the wall; the pulp is very yellow, has a rich flavour and cloſely adheres to the ſtone, where it is of a faint red; it ripens towards the middle of September.

Temple's NECTARINE TREE bears a middle ſized fruit, of a light red next the ſun, and of a yellowiſh green towards the wall. The pulp melts in the mouth, and is of a white colour at the ſtone, from which it readily parts, and has a fine flavour; it ripens towards the end of September.

The *Peterborough*, or *late green* NECTARINE TREE, bears a middle ſized fruit, of a pale green next the ſun, but of a whitiſh green towards the wall. It has a firm well flavoured fleſh in a good ſeaſon, and ripens in the beginning of October.

The flowers have an aromatic bitter taſte, and, when freſh, an infuſion of half an ounce in water, or a drachm when dry and ſweetened with ſugar, is a uſeful laxative for children. Peaches themſelves agree very well with perſons of hot conſtitutions, and coſtive, eſpecially if they are eaten in a morning faſting. Peach kernels are bitteriſh, diuretic, and good againſt worms. The leaves have the ſame virtues, and the gum reſembles gum arabic.

MANDRAGORA MAS, *ſeu* CANDIDA, *Mandrake* has a thick long root, generally divided into two parts, and ſometimes more; it is whitiſh without, or of a ruſty aſh colour, and pale within. It has no ſtalk, though it has leaves a cubit in length, and a palm and a half broad, and ſharp at both ends; among theſe pedicles ariſe ſtalks, a palm in length, on each of which there is a ſingle flower, in the ſhape of a bell, conſiſting of a ſingle leaf, divided into five ſegments; it is a little hairy, of a dirty white, or purpliſh colour, with a hairy green calyx, divided into five parts; from whence ariſes a piſtil, fixed in the bottom part of the flower, that turns to a fruit, like a ſmall apple, at firſt green, and then yellowiſh, fleſhy, ſoft, of a ſtrong nauſeous ſmell, and in the pulp there are roundiſh flat ſeeds, ſomewhat in the ſhape of a kidney.

MANDRAGORA FŒMINA *ſeu* NIGRA, *female Mandrake*, has leaves like that of the former, but narrower, leſs, and blacker; the flowers are of a bluiſh purple, and the fruit are paler, leſs, and in the ſhape of a pear. They both grow wild in Italy and Spain, as well as other hot countries, and delight in woody and ſhady places. With us they are cultivated in gardens, and the ſeeds are ſown in a bed of light earth, ſoon after they are ripe; they come up in the ſpring, and in very dry weather they muſt be refreſhed with water. They ſhould remain here till the end of Auguſt, and then they ſhould be tranſplanted to the places where they are to remain. The roots will continue ſound for above fifty years; but as to the reſemblance to a human form, as many aſſert, it is nothing but an impoſture, owing to perſons that would deceive the publick, who form the freſh roots of Bryony into ſuch ſhapes, and ſhow them for Mandrakes. Many wonderful things have been ſaid of its virtues, by different authors; however, they all agree it is a narcotick, and, when taken in too large a doſe, will produce dangerous ſymptoms. Some have given it from half a ſcruple, to procure ſleep. Some affirm, that the leaves applied outwardly, as a cataplaſm, will reſolve hard ſwellings of the ſpleen.

MARRUBIUM, *Hoar-hound*, has a ſingle woody root, which ſends forth many fibres, and ſeveral ſtalks, to the height of a foot and upwards; theſe are hairy, ſquare, branched, and the leaves proceed from the joints in pairs, which are placed oppoſite to each other; they are roundiſh, hoary, wrinkled, and crenated on the edges. The flowers likewiſe proceed from the joints, and ſurround the ſtalks; the calyx, or flower cup, is hairy, ſtreaked, and terminates in prickles; the flower conſiſts of a ſingle labiated leaf, of a whitiſh colour, whoſe upper lip is upright and forked, and the lower divided into three ſegments. The piſtil is fixed in the back part of the flower, like a nail, and attended with four embryoes, that turn to as many oblong ſeeds, contained in a capſula, that was the calyx of the flower. The whole plant has a ſtrong diſagreeable ſmell, and grows near highways, and on the ſides of fields, in neglected places. It is aperient, powerfully reſolves viſcid humours, and by ſome is accounted a ſpecific in a moiſt aſthma.

MARRUBIUM NIGRUM, *black Hoar-hound*, has a perennial fibrous root, and hairy, ſquare, light, branched, reddiſh ſtalks, with leaves that proceed from the joints in pairs, and are placed oppoſite to each other; they are like thoſe of the Balm, or rather red Archangel, only they are rounder and blacker; they are hairy, ſoft to the touch, and wrinkled. The flowers likewiſe proceed from the joints, and conſiſt of a labiated ſingle petal, whoſe upper lip is hollow like a ſpoon, and the lower divided into three ſegments, of which that in the middle is biggeſt, and in the ſhape of a heart; the colour is purple, ſtreaked with deeper lines of the ſame; the flower cups are ſtreaked, oblong, and divided into four or five ſharp ſegments. The piſtil is fixed in the back part of the flower, and is attended with four embryoes, that turn into as many ſmall oblong ſeeds, that are blackiſh when ripe, and contained in a tubulated capſula, with five ſides, that was the calyx of the flower. It grows wild by the ſides of hedges. The leaves are bitter, have a ſtrong ſmell, and by ſome are accounted an excellent remedy in hypochondriac and hyſteric diſorders.

MARUM VERUM, *ſive* MARUM CORTUSI, *Syrian herb Maſtich*, has a fibrous root, and a ſtalk that riſes to the height of a foot, or rather ſeveral hoary downy ſtalks, with leaves like the end of a lance, a quarter of an inch long, two broad, and of a light green above. The flowers are like thoſe of Germander, and conſiſt of a ſingle, labiated, purple petal, whoſe ſtamina are in the room of an upper lip; but the lower is divided into five ſegments, the middlemoſt of which is hollow like a ſpoon. The calyx is likewiſe like that of Germander, and the piſtil is fixed on the back part of the flower, with four embryoes, that turn into as many roundiſh ſeeds. This plant has the appearance of a ſhrub, and has a hot volatile ſmell. It is propagated by cuttings, in any of the ſummer months, on a bed of freſh light earth, obſerving to water and ſhade them, till they have taken root; after which they may be tranſplanted either in pots or borders of the ſame earth; but the greateſt difficulty is to preſerve it from cats, which will come from a great diſtance, to tear this plant in pieces; for which reaſon, it is hard to preſerve it near towns and cities. The beſt way is to plant large quantities thereof, and then they will not come near them. When they are placed in pots, they may be cut into any figure, for they will grow to near three feet high. It is ſaid to be good in cold and moiſt diſeaſes, and to be an excellent diuretick; though

though it is of little uſe with us, except in making herb-ſnuff. However, it is certainly better than Marjoram, and the doſe of the powdered leaves is a drachm.

MARUM, *herb Maſtich*, is a ſmall woody ſhrub, with many branches, and ſlender woody roots, with leaves like Thyme, but hoary, and which ſmell like Maſtich. The flowers are white, and conſiſt of a ſingle labiated petal, whoſe upper lip is upright, and divided into three ſegments, but the lower into three in ſuch a manner, that it looks like a flower with five leaves, and have a white down growing upon their oblong heads. This plant is propagated by cuttings, in any of the ſummer months, in a bed of light rich earth, obſerving to water and ſhade them till they have taken root, after which they may be tranſplanted into a light dry ſoil, in a warm ſituation. It produces great numbers of flowers in July, has an agreeable ſmell, and deſerves a place in the borders of every good garden. The virtues are the ſame as thoſe of the former, and it is undoubtedly an excellent cephalic.

MATRICARIA, *Feverfew*, has a white fibrous root, with ſeveral ſtalks, that riſe to the height of a cubit and a half; theſe are ſtrong, ſtreaked, ſmooth, thick, and full of a ſpongy pith, with many leaves of a light green colour; they are conjugated, and divided into many ſegments, which are by ſome called wings. The flowers grow in umbels, on the top of the ſtalks; they are radiated, but not large, and the diſk conſiſts of many yellow florets, and the crown of white ſemi-florets, placed over the embryoes of the ſeeds in a ſemi-ſpherical ſcaly cup. The ſeeds are oblong, ſmall, ſtreaked, and fixed in a bed at the bottom of the cup. The whole plant has a very ſtrong ſmell, and is found wild upon dunghills and uncultivated places, in many parts of England; it is likewiſe planted in gardens for medicinal purpoſes. They are propagated by ſeeds, which ſhould be ſown in the latter end of March, upon a bed of light earth, and when they are come up, they ſhould be removed to nurſery beds, and placed about eight inches aſunder, where they may remain till the latter end of May; then they may be taken up, with a ball of earth at their roots, and planted in the middle of large borders, where they will flower in July and Auguſt. It is an hyſteric plant, and is excellent in uterine diſorders. The doſe, in powder, is from half a ſcruple to two ſcruples, and of the juice to an ounce or two. It is certainly a very good carminative, as it diſcuſſes wind, ſtrengthens the ſtomach, and helps digeſtion. Outwardly, it is preſcribed in fomentations, with camomile flowers.

MELILOTUS, *Melilot*, has a white, ſlender, tough root, with many ſhort fibres, and generally ſeveral ſtalks, which ſometimes riſe to a cubit and a half in length; theſe are ſmooth, round, ſtreaked, and weak, and the leaves are placed alternately thereon, by threes, on the ſame ſlender pedicle; they are ſmooth, oblong, denticulated, and of a duſky green. The flowers grow on long ſpikes, and are papilionaceous, ſmall, yellow, and conſiſt of four petals; theſe are ſucceeded by ſhort, ſingle, pendulous, wrinkled, naked pods, not hid in a calyx, as in trefoil, and they are black when ripe, containing one or two roundiſh ſeeds of a yellowiſh colour. It is found near hedges, and among corn. It is ſeldom given inwardly, but is often uſed outwardly, and in clyſters. It is ſaid to be emollient, anodyne, and reſolvent, and is uſed by ſome in all kinds of external inflammations.

MELISSA, *Balm*, has a round, long, fibrous, woody root, with ſtalks that riſe to a cubit high, and upwards; theſe are ſquare, almoſt ſmooth, branched, hard, ſtiff and brittle. The leaves are oblong, of a browniſh green, and pretty much like thoſe of calamint; but they are ſhining, covered with a little down, and dentated on the edges. The flowers grow at the places where the leaves proceed from the ſtalks, and are ſomewhat verticillated, though they do not grow quite round the ſtalks; they conſiſt of a ſingle labiated petal, whoſe upper lip is roundiſh, upright, and divided into two parts; but the under lip is cut into three. The hairy calyx is divided into two parts, and the piſtil is attended with four embryoes, that turn to as many ſeeds, joined together, of a roundiſh ſhape, and contained in a capſula that was the cup of the flower. It is cultivated in gardens, and flowers in June, July, and Auguſt. It is propagated by parting the roots, either in ſpring or autumn, or by planting ſlips at the diſtance of eight or ten inches. Balm is ſaid to be cordial, cephalic, and to fortify the ſtomach. It is taken in the manner of tea, is a little aromatic, and has done ſervice in a lax ſtate of the viſcera.

MELISSA SYLVESTRIS, *wild Balm*, is nothing leſs than the former in its primitive ſtate, before it is cultivated in gardens. This plant has a bad ſmell, and grows in woods, flowering in May and June. It is reckoned a vulnerary, and is ſaid to be an excellent remedy againſt ſuppreſſion of urine.

MELO VULGARIS, *common muſk Melon*, is a plant, with ſtalks that creep along the earth, and are rough to the touch, as well as the leaves, which are ſmaller and rounder than thoſe of Cucumbers. The flower conſiſts of a ſingle petal, in the ſhape of a bell, cut into ſeveral ſegments, exactly like thoſe of a Cucumber, and ſome of them are barren, while others are fruitful, and turn into a fruit of an oval ſhape, and different ſizes; the rind is harder than that of a Cucumber, pretty thick, variegated with green and aſh colour. The pulp is tender, moiſt, clammy, yellow, or red, and when ripe, has a very agreeable flavour. It is divided into three cells, containing oblong, flat, whitiſh yellow ſeeds, covered with a hard ſkin, containing an oily kernel, but is very white, and has a ſweetiſh taſte. There are ſeveral ſorts of Melons, beſides that already mentioned, as the *Portugal, or pocket Melon, the netted or wrought Melon, the great muſk Melon, with a ſmooth green ſkin, and a green ſeed, the white Spaniſh Melon, the green fleſhed Melon, the Cantaleupe Melon, the Zatta Melon, the Melon with a hairy ſkin, and the winter Melon.* The ſeeds ſhould not be ſown till they are three years old, and it ſhould be at two or three different ſeaſons, the firſt of which is the latter end of February, when the weather is mild, on the upper ſide of a a Cucumber bed, and the plants muſt be raiſed and managed in the ſame manner as Cucumbers. The ſecond ſeaſon is about the latter end of March, and they both ſhould be planted under frames. Thoſe that are deſigned to be raiſed under bell-glaſſes, muſt be ſown about the latter end of April, if the ſeaſon proves forward; but if it be cold, it had better be deferred ſomewhat later. There are particular rules required for their management, that are too long to be inſerted here, and therefore we ſhall only obſerve, that when the fruit is fully grown, they muſt be carefully watched, to cut them at a proper time; and therefore they ſhould be looked over at leaſt twice a day; for if they are left growing a few hours too long, they will loſe much of their delicacy. If they are cut early in a morning, before the ſun has warmed them, they will be much better flavoured.

The ſeeds of Melons are one of the greater cold ſeeds, and ſerve to make emulſions; but at preſent they are not ſo much taken notice of as formerly.

MENIANTHES, *ſive* TRIFOLIUM PALUSTRE, the *Buck-bean*, has a long, knotted, creeping root, which has fibres by intervals, and there are three

three leaves that grow on the ſame pedicle, that are of the ſame ſize and ſhape as thoſe of beans, and ſmooth to the touch. Among theſe there ariſes a ſtalk to the height of a foot and a half, which is ſlender, ſmooth, green, and bears a tuft of flowers at the top, in the ſhape of a funnel, and of a whitiſh purple colour. Before they open they are red, and after they are open they divide into five pointed ſegments; their internal ſurface is covered with very ſlender, white, curled filaments, that appear like down. The cup of the flowers is in the ſhape of a mug, and dentated, and each flower contains five white ſtamina, with yellow apices; the piſtil is placed in the middle, and is ſhorter and greener than the ſtamina. Theſe are ſucceeded with roundiſh or oblong fruit, that contains oval ſeeds like thoſe of the Sun flower. This plant grows wild in marſhes, and flowers in May or June. Buck-bean has gained great reputation for its virtues, and is found very efficacious in the gout, king's-evil, the cachexy, and dropſy. In a fit of the gout, the patient muſt drink a glaſs of the decoction every four hours; but Boerhaave was relieved in this diſtemper, by drinking the juice mixed with whey. It will be likewiſe proper to apply the leaves that have been boiled, to the painful part, after the decoction is ſtrained off. The ſeed is good againſt the moiſt aſthma, for it incides the groſs phlegm that ſtuff the lungs. This plant is in ſuch reputation in Germany, that they give it in almoſt all diſeaſes.

MENTHA VULGARIS, *garden, or ſpear Mint*, has a creeping root, furniſhed with fibres, that extend far and near; the ſtalks riſe to a foot and a half in height, and are ſquare, a little hairy, ſtrong, and reddiſh. The leaves are placed by pairs oppoſite to each other, and appear at firſt ſight like Balm; but thoſe at the top of the ſtalk are longer, and more pointed, and of a deep green colour; they are alſo more deeply dentated. The flowers grow in ſpikes, and conſiſt of a ſingle labiated petal, whoſe upper lip is arched, and the lower divided into three parts; but both of them are ſo cut, that the flowers ſeem to be divided into four parts, the two lips ſcarcely appearing. Each flower is ſucceeded by four ſeeds contained in the flower cup. Mint has a peculiar well known ſtrong ſmell. It is cultivated in gardens, and flowers in July and Auguſt. Beſides this, there is the *pepper Mint*, the *long leaved horſe Mint*, *water Mint*, *commonly called water Calamint*, *orange Mint*, *Spear-Mint with a variegated leaf*, the *great round leafed water Mint with a variegated leaf*, *Spear-mint with a rugged leaf and a ſtrong ſcent*, and *narrow leaved Aleppo Mint*. They are all propagated by parting the roots in the ſpring, or by planting the cuttings in any of the ſummer months.

SPEAR-MINT is ſtomachic, cephalic, and carminative, and is excellent in the loſs of appetite, retchings to vomit, and weakneſs of the ſtomach. It reſolves coagulated blood, eaſes pains of the cholic, and does a great deal of ſervice in fluxes of the belly. It may be drank as tea, eſpecially when the leaves are dry, and the infuſion muſt be ſtrong. Water Mint has a bitter, acrid, aromatic taſte, is ſtomachic and diuretic, and, like the former, may be drank as tea. The juice is good againſt the gravel, ſtops vomiting, and hiccoughing, cures the gripes, and ſwelling of the ſtomach.

MENTHA ALBA, *ſive* MENTASTRUM, *Horſe-Mint*, has a fibrous creeping root, and ſends out ſtalks to the height of a cubit, and upwards, which are ſquare and hairy. The leaves are almoſt round, wrinkled, and covered with a white wool. The flowers are like thoſe of garden Balm, and are of a whitiſh red colour, with dentated flower-cups. Each flower is ſucceeded by a ſmall black ſeed. The leaves have a bitter, acrid, aſtringent taſte, with a ſtrong ſmell, and it grows by the ſides of brooks, and in moiſt places in moſt parts of England. It is ſaid to kill worms, to help the moiſt aſthma; and many apply a cataplaſm made with this plant, to the affected part, againſt the hyp gout; they affirm it raiſes bliſters, which when broken eaſe the pain.

MENTHA PIPERITES, *Pepper-mint*, has ſhorter and fuller ſpikes than the common Mint, but the leaves are like them, only they are covered with a ſhort hairy down. This plant has been lately brought into eſteem, and is of great uſe in flatulent cholics, and in many cold diſeaſes; its effects are almoſt immediately felt; for it cauſes a glowing warmth to be felt throughout all parts of the body. It readily communicates its pungency to water, as well as to that which is diſtilled from it.

MERCURIALIS, *male and female French Mercury*. The male has a tender, fibrous, annual root, and ſends forth ſtalks to the height of a foot, that are angular, geniculated, ſmooth and branched. The leaves reſemble thoſe of pellitory, and are oblong, pretty broad, ſharp, ſmooth, and green; they are placed by pairs oppoſite to each other on the ſtalk, and are crenated on the edges; the flower cup conſiſts of one leaf cut into three ſegments, as well in the male as in the female. The flower of the male has no petals, but has from eight to twelve ſtamina collected into a ſpike. There are two embryoes contained in a ſort of purſes, and, when they are ripe, there is in each a ſmall oval ſeed.

The *female Mercury* reſembles the male in all reſpects, except the flowers; for theſe produce neither fruit nor ſeed. The virtues are both alike, and they flower all the ſummer. The leaves are ſaid to be aperient and laxative, and they are placed among the five emollient plants. It is ſometimes made uſe of in clyſters, and a ſyrup made of the leaves is a mild and uſeful laxative; the doſe is two ſpoonfuls, which is to be given three hours before meals. Warts rubbed with this plant will frequently ſoon wither away.

MESPILUS APII FOLIIS SYLVESTRIS SPINOSA, *ſive* SPINA ALBA, the *White Thorn or Hawthorn*, is a ſhrub that has a pretty thick firm trunk, full of branches, and armed with ſtrong thorns, that are much harder than the wood. The branches are ſtrong and flexible, and the leaves are like thoſe of parſley, and have a clammy taſte. The flowers grow in tufts, and have pedicles about an inch and a half in length; they are white, have five petals, placed in the form of a roſe, and reddiſh ſtamina, like thoſe of the pear-tree. The fruits, or haws, are a little larger than Myrtle-berries, are red when ripe, and hang in bunches. They have a black navel, and are full of a clammy, ſoft, ſweetiſh pulp, wherein are two hard white ſtones. It grows every where in hedges, and flowers in May; the berries grow ripe in September, and continue a great part of the winter, when the leaves are falling off.

MESPILUS PYRIFOLIA, *ſive* PYRICANTHA, the *ever-green Thorn*, is a thorny ſhrub, covered with a blackiſh bark, whoſe branches are armed with thorns, whereof ſome are an inch in length, and others ſhorter. The leaves reſemble thoſe of the wild pear-tree, or rather the almond tree; ſome are oblong, and a little pointed, while others are almoſt round, ſmooth, and dentated on the edges, eſpecially the lowermoſt. The flowers conſiſt of ſeveral petals, of a reddiſh colour, and diſpoſed in the form of a roſe. The berries are like thoſe of the hawthorn, and of a golden ſcarlet colour, growing together in bunches, and furniſhed with a ſort of a crown. The pulp is a little tartiſh,

and contains four or five whitiſh yellow ſeeds, of a triangular ſhape, and a little ſhining. It grows in the hedges in Italy, and the ſouthern parts of France; but elſewhere it is cultivated in gardens. It flowers in May, and the berries grow ripe in autumn. Children are very fond of them, and they have the ſame taſte and properties as haws.

MILIUM, *Millet*, has many fibrous, and ſtrong, whitiſh roots, that ſend forth ſtalks to the height of two or three feet, which have ſeveral knobs. The leaves are large, long, and about an inch broad, in the ſhape of thoſe of reeds; they are covered with a ſort of thick down, at the places where they ſurround the ſtalk, after which they become ſmooth; the flowers grow in looſe panicles at the top of the ſtalks, and are generally yellow, though ſometimes blackiſh; they are compoſed of three ſtamina, that proceed from the middle of the flower-cup, which generally conſiſts of two leaves. When the flowers are fallen off, they are ſucceeded by oval grains, that are yellowiſh or white, hard, ſhining, contained in three ſorts of thin tender ſhells. Theſe plants were originally brought from the eaſtern countries, where they are ſtill greatly cultivated, and from whence we have the grain, which is highly eſteemed by many for making puddings. It is a common aliment in the eaſtern countries, where they boil it in milk, and it has the ſame virtues as rice. It is good in diſorders of the breaſt and obſtinate coughs; but it is a little binding and windy.

MILLE FOLIUM VULGARE, *Yarrow, or Noſe-bleed*, has a woody, fibrous, blackiſh, creeping root, from whence proceed a great number of ſtalks, to the height of a foot, or a foot and a half, that are ſtiff, angular, hairy, reddiſh, and branched at the top. The leaves are divided and ſubdivided into a vaſt number of ſegments, adhering to a long rib, and have ſome reſemblance to thoſe of camomile; but they are more ſtiff, and ſomewhat like the feathers of a bird. The flowers are collected into round umbels, each of which is radiated, whitiſh, and placed in a ſcaly cylindric calyx, and are ſucceeded by very ſmall ſeeds. It grows in uncultivated ſandy places, where the leaves generally lie cloſe to the ground till the ſtalks begin to riſe. It is called Nooſe-bleed by the country people, becauſe a ſprig of it put up the noſe will bring away a little blood. It flowers in May and June, and has an acrid, bitter, aromatic taſte. It is a vulnerary plant, and is ſaid to cure wounds, tumours, and inflammations without repulſion.

MYAGRUM, *Gold of Pleaſure*, has a fibrous root, a little woody, which ſends forth a ſtalk to the height of a cubit and upwards, from whence proceed ſeveral cylindric, ſtrait, ſlender branches, a little downy, and full of a ſpongy pith. The leaves are longiſh, pointed, ſoft, of a paliſh green, ſlightly dentated on the edges, and their bottoms ſurround their ſtalk in ſuch a manner, that the ſides repreſent two wings or ears. The flowers conſiſt of four petals, placed in the form of a croſs, and of a yellowiſh colour; the piſtil ariſes out of the calyx, and afterwards becomes a fruit in the ſhape of a pear, with one cell, including an oblong ſeed, and two empty cells at the point. It is an annual plant, that decays as ſoon as the ſeeds are ripe, and grows wild in ſeveral parts of Europe. The oil of theſe ſeeds is emollient, and moderately heating, and it is given inwardly in a painful coſtiveneſs.

MYRRHIS, *ſweet Cicily*, has a long, thick, white, ſoft, and ſomewhat ſpongy root, with ſtalks that riſe to the height of four or five feet, which are branched, downy, and hollow. The leaves are large, and winged like thoſe of hemlock, but whiter, and often marked with white ſpots; they are ſoft to the touch, a little downy, and have the ſmell of chervil. The flowers grow in umbels on the tops of the branches, and are compoſed of five unequal petals, diſpoſed like thoſe of the flower-de-luce. The calyx turns to a fruit, compoſed of two ſeeds, reſembling the bill of a bird, and are gibbous on one ſide, but plain on the other. It may be propagated at the beginning of March, by ſowing the ſeeds on a bed of light earth in a ſhady ſituation; and when the plants come up they ſhould be tranſplanted into the like earth in a moiſt ſhady ſituation, about two feet aſunder. Some uſe the leaves as a ſallad, and think it is as good as common chervil; it flowers in June, and the ſeed is ripe in July. It is looked upon as a pectoral, and the leaves when dried in the ſhade, and ſmoaked like tobacco, help thoſe that are troubled with an aſthma.

MYRTUS MINOR VULGARIS, *Box-leafed Myrtle*, is a ſhrub that has a hard woody root, that ſends forth a great number of ſmall flexible branches, furniſhed with leaves like thoſe of box, but much leſs, and more pointed; they are ſoft to the touch, ſhining, ſmooth, of a beautiful green, and have a ſweet ſmell. The flowers grow among the leaves, and conſiſt of five white petals, diſpoſed in the manner of a roſe, and have a calyx cut into five ſegments. There is a great number of ſtamina, which have a fine ſmell, and when the flower is fallen off, the calyx becomes an oval oblong berry, adorned with a ſort of crown, made up of the ſegments of the calyx. The berry is green at firſt, but grows black when ripe, and is ſmooth, juicy, and divided into three cells, containing hard ſeeds in the ſhape of kidneys. This ſort of myrtle is the moſt common in the gardens of the northern countries, and is propagated from cuttings, the beſt ſeaſon for which is in July. The ſhoots ſhould be ſix or eight inches long, and the leaves on the lower part ſhould be ſtripped off above two inches high, and the part twiſted which is to be placed in the ground. They ſhould be planted in pots, two inches diſtant from each other; the earth ſhould be preſſed cloſe about them, and there ſhould likewiſe be ſome water to ſettle it. The pots ſhould be plunged in old dung, or tanner's bark, and ſhaded with mats in the heat of the day, watering them occaſionally. In about a month's time they will take root; and, towards the beginning of September, they ſhould be removed to a place ſheltered from cold wind, where they may remain a month, and then be removed to the green houſe. At the beginning of the next April, they ſhould be taken out carefully, and placed in ſeparate pots, with a ball of earth at the root.

MYRTUS BRABANTICA, *Dutch Myrtle*, is a ſmall ſhrub, with a hard flexible root, and riſes to the height of a cubit or upwards; it has the look of a ſmall willow, for which reaſon it is called by ſome Sweet Willow. There are male and female flowers on different plants, and thoſe of the male are oblong, looſe, ſcaly catkins, and in each of the ſcales there is a flower in the ſhape of a Half moon, but without petals, though there are from five to ſix ſtamina. The female flowers have no ſtamina, but an oval piſtil, ſupported by two ſtyles, which afterwards changes to a berry, containing one roundiſh ſeed. It grows plentifully upon bogs in many parts of England, and flowers in May and June; and the ſeeds grow ripe in July and Auguſt. Where this ſhrub grows in plenty, it is ſo fragrant, eſpecially after a ſhower of rain, as to perfume the air at a great diſtance, during the ſpring and ſummer. The leaves have been ſaid to have many virtues, and they are ſtill uſed in ſome places to kill worms.

NARCISSO-LUCOIUM, *Snow-drop*, has a bulbous root, compoſed of ſeveral white coats, except the outermoſt, which is brown, and underneath there are whitiſh fibres. It ſends forth three, four, or five leaves, like thoſe of leeks, which are green, ſmooth, and ſhining; among theſe ariſe an angular, furrowed,

furrowed, hollow ſtalk, ſix inches high, cloathed with leaves as far as the middle, which form a kind of white ſheath. It generally bears but one flower at the top, though ſometimes two, but ſeldom three. The ſheath of the flower is oblong, blunt, compreſſed, and opening ſideways becomes a dry ſkin; the flower itſelf has three oval oblong petals, which are ſpread open, and are equal; the nectarium is ſeated in the middle, and is cylindrical, blunt, and bordered. The piſtil is placed in the center of the flower, attended by ſix ſtamina, and afterwards becomes an oval capſula, with three cells full of roundiſh ſeeds. They are of two ſorts, the ſingle and the double; and they are valued for their early appearance, which is commonly in February. The roots ſhould never be planted ſingle, becauſe the flowers make the beſt appearance when they grow in bunches. When there are twenty or more roots together, they have a very good effect. The root is of no uſe in medicine.

NASTURTIUM HORTENSE, *garden Creſſes*, have a ſingle, woody, white root, that is not ſo acrid as the leaves. This root ſends forth ſeveral ſtalks, to the height of a foot, or a foot and a half, that are round, ſmooth, ſolid, branched, and covered with a ſort of bluiſh duſt, that will readily come off. The leaves are oblong, deeply cut, and have no diſagreeable taſte. The flowers grow on the tops of the branches, and conſiſt of four petals, placed in the form of a croſs, and of a whitiſh purple colour. The piſtil, which riſes from the center of the flower-cup, becomes a roundiſh ſmooth fruit, divided into two cells, containing ſmall, oblong, yellowiſh ſeeds. It is cultivated in gardens as a ſallad herb, and is in moſt eſteem in the winter, and in the ſpring. During the winter they muſt be ſown on a gentle hot-bed, covered with mats or glaſſes; in the ſpring upon warm borders, and in the ſummer upon thoſe that are ſhady. They attenuate and cut groſs thick humours, and are good in obſtructions of the viſcera. It may be eaten plentifully as a ſallad, and therefore nothing need to be ſaid of the doſe.

NASTURTIUM AQUATICUM, *Watercreſs, or Creſſes*, have a ſmall white root, full of knots, from each of which ſeveral capillary fibres proceed, that enter into the water. The ſtalk ariſes to the height of a foot, and is crooked, thick, hollowed, furrowed, ſmooth branched, and of a green colour, with a reddiſh caſt. The leaves are almoſt round, juicy, of a greeniſh brown colour, and have a biting agreeable taſte. The flowers grow on the top of the ſtalks, and are ſmall, white, compoſed of four petals in the form of a croſs, with ſeveral yellow ſtamina and apices; theſe are ſucceeded by pods, that are a little crooked, and divided into two cells full of roundiſh, ſmall, reddiſh ſeeds, of an acrid taſte. It grows on the ſides of brooks and ditches, and flowers in July and Auguſt. It is uſed as a ſallad herb, eſpecially in the winter. When the leaves firſt appear, they are almoſt round, but afterwards they are cut like thoſe of rocket. It has much the ſame virtues as garden creſſes, but ſtronger, and is accounted one of the beſt antiſcorbuticks in theſe parts of the world.

NEPETA, *Nep, or Cat-mint*, has a woody root, divided into ſeveral branches, and ſends forth a ſtalk three feet high and upwards, which is ſquare, hairy, branched, reddiſh near the ground, and the upper part whitiſh; the branches are always produced oppoſite to each other by pairs; the leaves are like thoſe of the nettle or betony, and are ſerrated on the edges; they are pointed, downy, whitiſh, and have long pedicles, and have a ſtrong ſmell of mint, with a biting acrid taſte. The flowers grow on the tops of the branches, where they are collected into ſix ſpikes; they are purple or whitiſh, and they each conſiſt of a tube, whoſe upper lip is cut into two ſegments, and the lower into three; the middle ſegment is broad and hollowed like a ſpoon, and elegantly crenated on the edges; it is ſuſtained by a calyx, in the ſhape of a horn, and ſucceeded by four naked oval ſeeds. It is called cat-mint, becauſe the cats will not ſuffer it to grow, and is propagated by ſowing the ſeeds in March, in beds or borders of common earth; but it is found wild in many parts of England. It is aperient, has all the virtues of common mint, and may be drank in the manner of tea. When the cats eat too much of it, it will make them drunk; but, what is very remarkable, if it be raiſed from ſeeds the cats will not touch it.

NICOTIANA MAJOR LATIFOLIA, *the greater broad-leaved Tobacco*, has a white fibrous root, which ſends forth a ſtalk to the height of five or ſix feet, as thick as one's thumb, and round. It is hairy, and full of a white pith. The leaves are large, without pedicles, and placed alternately on the ſtalks by their large appendages; they are hairy, full of nerves, a little pointed, clammy to the touch, and of a pale green, inclining to yellow. They are divided into ſeveral branches at the top, that ſupport flowers in the ſhape of a bell, divided into five deep ſegments, as as well as the calyx, which expand like a ſtar. They are of a purple colour, and the apices of the ſtamina are ſprinkled with a fine powder of an aſh colour. The embryo becomes an oblong, roundiſh, membranaceous fruit, divided into two cells full of reddiſh ſeeds, that are exceeding ſmall, in proportion to the bigneſs of the plant. It is a ſummer plant with us, though it will ſometimes, in moderate winter, continue all the year. It is known by the American planters, under the title of Oroonoko Tobacco; but it is not in ſuch eſteem with the Engliſh, as the other ſorts. In Braſil it flowers continually, and will live ten or twelve years.

NICOTIANA MAJOR ANGUSTIFOLIA, *the greater narrow-leaved Tobacco*, differs only from the former in their leaves, which are narrower, and more pointed, and are fixed to the ſtalk by pretty long pedicles.

NICOTIANA MINOR, *the leſſer, or common Engliſh Tobacco*, has a ſingle thick root, ſometimes divided into ſeveral tender white fibres, and ſends forth a ſtalk to the height of two feet, which is hairy, ſolid, ſometimes as thick as one's finger, branched, and clammy to the touch. The leaves are rounder than thoſe of the former ſorts, and are placed alternately on the ſtalks; they are flat, blunt at the end, of a greeniſh brown, and have ſhort pedicles. The flowers are numerous on the top of the branches, and are divided into five ſegments like the former; they have five ſtamina, whoſe apices are of an aſh colour, as well as the piſtil; they are leſs than thoſe of the former kind, and the colour is of a greeniſh yellow. The calyx is hairy, clammy, and divided into five parts. The flowers are ſucceeded by roundiſh capſula, in the form of a navel, and, when ripe, open into two parts, and are full of a vaſt number of yellow tawny ſeeds. Beſides theſe, there are other ſorts, as *the greater narrow-leaved perennial tobacco; the leſſer tobacco with larger and rougher leaves; the great broad-leaved tobacco with white flowers, and a ſhort ſeed veſſel; the dwarf tobacco with a primroſe leaf; and the ſmall tobacco with a leaf in the ſhape of a heart, and a flower with a longer tube.* The firſt of theſe ſorts is moſt common in England, and is generally raiſed by the gardeners near London. They were all brought originally from America, and at firſt were in high eſteem for their medicinal qualities. It is called tobacco from the iſland of Tobago, from whence it was brought in the year 1560.

The taſte and ſmell of tobacco is well known, as well as its common uſe. Some uſe it as a vomit, which ſhould be never done, except in caſes of neceſſity. The watery extract made by long boiling, and

and preſerved dry, has a cleanſing anodyne quality, and is excellent for appeaſing an aſthmatic cough. It may be taken in broth, or with a ſtomachic remedy to four or five grains. In ſome delicate conſtitutions, it will occaſion a retching to vomit, which may be eaſily remedied with a draught of burnt wine. Outwardly, the plant is cleanſing and healing, and will ſoon cure malignant ulcers, when other things fail. Some make an ointment of tobacco for the killing of lice, but it ſhould be uſed very cautiouſly. When it is beaten into a cataplaſm with vinegar or brandy, it will remove hard ſwellings of the liver and ſpleen, as we learn from the Edinburgh eſſays. Some recommend the ſmoaking tobacco in the time of the plague, and other infectious diſeaſes. We know an inſtance of the efficacy of ſmoaking tobacco in a perſon, who was thereby cured of a dry aſthma, when all other remedies had failed. Having ſmoaked part of a pipe, merely for good company ſake, he found ſuch an abatement of his cough, as induced him to purſue it, which at laſt effectually cured him, by gradually bringing off his lungs the coagulated matter, with which they were clogged. However, this may not ſucceed in every conſtitution; and it will be prudent not to continue it, if after once or twice ſmoaking, the patient has not ſome ſubſtantial encouragement to proceed, which may compenſate for the ſickneſs tobacco always occaſions thoſe, who are not uſed to ſmoaking it.

NIGELLA ROMANA, *Roman Fennel-flower*, has a root with many furrowed ſlender ſtalks, a foot in height; the leaves are pretty large, green, and cut into ſlender ſegments. The flowers are placed at the tops of the branches, diſtinct from each other, and are compoſed of five petals, of a pale colour, and diſpoſed in the form of a roſe. There are ſeveral ſtamina in the middle, ſurrounded with a crown, and are ſucceeded by a membranous fruit, and divided into ſeveral cells, that terminate in horns. This plant is cultivated in gardens, and flowers in July, Auguſt, and September. The ſeeds brought from Italy are the beſt, and ſhould be freſh, large, and of a fine yellow colour or black. It is reſolvent, diſcutient, and ſtrengthening, and is proper for correcting the impurities of the ſtomach, breaſt, and kidneys. It is good againſt catarrhs of the head, the head-ach, ariſing from thence, the vertigo, and obſtructions of the noſe, either in fumigations, or ſnuffed up when powdered. The doſe inwardly is from one ſcruple to a drachm. It is of great uſe among the Germans, but neglected by us.

NOLI ME TANGERE, *ſive* BALSAMINE, *Balſamine*, has a root that runs level with the ground, and ſends forth a ſtalk to the height of a foot and a half, which is tender, of a bright green, ſmooth, ſhining, light, branched, geniculated by intervals, with tuberoſities. The leaves are placed alternately, and are deeply dentated on the edges. From the places, where the leaves join to the ſtalk, there proceed long pedicles, that bend down to the ground, which are divided into three or four branches, on which hang ſmall flowers, with four unequal petals, ſupported by two ſmall green leaves; but the flower is yellow, repreſenting a kind of a ſea-monſter, with a ſmall body, and a ſlender, ſhort, crooked, pointed tail, like an ox's horn, ſprinkled with deep red ſpots; the mouth is wide, and in the middle there are ſeveral ſtamina, of a whitiſh colour. They are ſucceeded by long, ſlender, knotted fruit, of a whitiſh green, ſtreaked with green lines, bending to the ground. They open as they grow ripe, and when the wind blows a little ſtronger than ordinary, or by the leaſt touch, they ſhoot out their ſeeds, at the ſame time writhing themſelves like worms; the ſeeds are either aſh coloured, brown, or red. Thoſe that are not uſed to this plant, are always ſtartled when the ſeeds burſt out in the above manner; and from its not bearing to be touched without this effect, it is called *Noli me tangere*, that is, *touch me not*. It grows wild in ſome places, and flowers in June, and it is alſo cultivated in gardens, for the diverſion it affords. It is propagated by the ſeeds, and if ſuffered to caſt them, it will come up every ſpring without any care; but it delights moſt in moiſt ſhady places. It is very aperient and diuretic, and frees the kidneys from gravel.

NUMMULARIA, *Moneywort*, has a very creeping ſlender root, and ſends forth ſeveral long, ſlender, angular, branched ſtalks, that creep on the ground, and whoſe leaves are placed in pairs oppoſite to each other; they are about as broad as one's finger, and are almoſt round, though a little curled, and of a yellowiſh green; where the leaves join to the ſtalk, the flowers proceed, which are large, and conſiſt of a ſingle petal, cut into the ſhape of a roſe. On ſome branches there are three leaves, and as many flowers at each knot. They are ſucceeded by ſmall round fruit, containing ſeeds hardly viſible. It is called moneywort from its roundneſs of the leaves, and is common in moiſt places, and by the ſides of ditches. It begins to flower in May, and continues to do ſo moſt of the ſummer. The leaves are aſtringent and vulnerary, and proper to ſtop hæmorrhages, both inwardly and outwardly. The doſe of the juice is from one ounce to three, and, in decoction, from one handful to three. Boerhaave recommends it greatly againſt the hot ſcurvy.

NYMPHÆA ALBA, *white Water-lily*, has a long root, as thick as one's arm, and ſometimes as the leg, full of knots of a brown colour without, and white within; it is fleſhy, ſpongy, full of clammy juice, and adheres at the bottom of the water to the earth, by ſeveral fibres. It ſends forth large roundiſh leaves, in the ſhape of a heart, that are thick, fleſhy, veinous, and of a whitiſh green colour on the top, and of a browniſh green beneath, and ſwims on the ſurface of the water; theſe are ſupported by long pedicles, as thick as a child's finger, which are cylindric, reddiſh, tender, juicy, and ſpongy. The flowers are large and broad when blown, conſiſting of ſeveral leaves, diſpoſed in the form of a roſe, of a fine white colour, but of little or no ſmell. The flower cup conſiſts of five whitiſh leaves, and there are other leaves on the edges, of a whitiſh green colour. There are a great number of ſtamina, with a piſtil that turns to a globular fruit, like the head of a poppy, divided into ſeveral cells, full of oblong, blackiſh, ſhining ſeeds. It grows wild in marſhes and ſtanding waters, and flowers in May and June.

NYMPHÆA LUTEA MAJOR, *the great yellow Water-lily*, differs from the former, in having leaves not quite ſo round, and in the flower, which is yellow, beſides which the fruit is of a conical ſhape, and contains larger ſeeds. It is found in the ſame places, and flowers at the ſame time as the former. The roots have both the ſame virtues, and have a clammy bitteriſh taſte. They are proper in heat of urine, want of reſt, and all internal inflammations, but are now ſeldom uſed. The powder of the dried root is given from a ſcruple to a drachm.

OLEA MAJOR, *ſive* HISPANICA, *the manured Olive tree*, has a trunk that is knotted, and more or leſs high, with a ſmooth aſh coloured bark, and yellowiſh wood, that has ſomewhat of a bitter taſte. The leaves are oblong and narrow, almoſt like thoſe of willow; they are pointed, thick, fleſhy, hard, of a greeniſh yellow above, and whitiſh below, but without down; they have very ſhort pedicles, and are generally placed by pairs oppoſite to each other. The flowers proceed from the places where the leaves are joined to the ſtalks, and grow in whitiſh branches, like thoſe of the alder; they conſiſt of a ſingle petal,

the lower part of which is hollowed, and the upper is divided into four parts; the embryo of which is fixed in the center of the flower cup, and becomes an oval, green, fleshy, succulent fruit, of different sizes; for in Spain it is as big as a middling plumb; whereas in Italy and Languedoc, it scarce arrives at the size of a common acorn. This is the olive, which is at first green, then yellowish, and at length blackish, when it is full ripe; though there are some in Spain that turn white. They are oily, have an acerb disagreeable taste, and contain an oblong stone, which is very hard, and within it is a kernel of the same shape. It is cultivated in the southern parts of Europe, and delights in dry, marly places, that are exposed to the south or east; and it flowers in June and July. This tree continues a long time, and the wood which has a fine smell, will burn as well green as dry. They produce a large quantity of fruit, of which they make oil-olive, or sallad-oil, well known all over Europe. They are planted out of curiosity in England, in pots or cases, but must be removed into the green-house all the winter. There are several sorts of olives that differ in shape, colour, size, and juice. They are pickled, and then become agreeable to the taste; and are well known in England by the name of pickled olives; they are then said to create an appetite, and strengthen the stomach.

ONOBRYCHIS, *Cock's-head, or Sain-foin*, has a long, hard, woody root, black without, and white within, which sends forth several strait strong stalks, about a foot in height, and of a reddish green colour. The leaves which are like those of vetches, but smaller, are green above, white and downy below, pointed, and placed by pairs on one side. The flower is papilionaceous, and the pistil rises out of the downy flower cup, which afterwards turns to a crested pod, in the shape of a cock's-comb, and is rough, with prickles; each of these contain a seed, in the shape of a kidney, which has a pretty good taste when it is green. *Sain-foin* is a French word, which signifies wholesome hay, and is so called, because it is thought to fat all sorts of cattle the soonest of any other. The hay made of it is accounted among us the best sort of food for most cattle, especially in the spring, there being no danger attending it, as there is in clover; it breeds abundance of milk, and the butter that is made of it is very good. There is a sort with a deep red flower, which, when disposed in the large borders of pleasure gardens, afford an agreeable variety; for they are of a beautiful colour, grow in long spikes, and continue a great while. Some observe, that if *Sain-foin* be carefully gathered, well dried, and kept in boxes, it has the smell of tea, insomuch that it has been mistaken by good judges for green tea; but then it must be gathered before it flowers.

OPULUS, *sive* SAMBUCUS AQUATICA, *Marsh elder, or Gelder-rose*, has a thick, firm, white root, that sends forth a stalk to the height of five or six cubits, divided into several branches, like those of the elder tree, and is knotted by intervals; it is covered with a smooth ash coloured bark or rind, is full of white spongy pith; and is very tender and brittle. The leaves proceed from the knots, and are large, angular, and like those of the maple tree. The flowers consist of a single petal or leaf, divided into five parts at the top, and expanded in the form of a rose. Those about the circumference of the umbel are larger than the rest, and of a fine white, with a calyx that proceeds from the middle of the cup, but they are barren. Those in the middle or centre are smaller, open later, and in their bottom there is a hole that receives the point of the calyx, and they are of a yellow colour. This turns to a berry a little larger than that of the common elder, which is soft and red when ripe; in each of these there is a flat red seed in the shape of a heart. This shrub delights in moist woods, and on the banks of rivers, and it flowers in May; but the berries are not ripe till autumn, and they continue all the winter. There is another *Gelder-rose*, that differs from the former, only in having the flowers collected into a globe, and is common in old gardens in most parts of England. At a distance the flowers resemble snow-balls, for which reason it is called in some countries the *Snow-ball tree*. It is of no use in medicine.

ORCHIS, *seu* SATYRIUM, *Fool-stones*, has a root composed of two tubercles almost round, which are fleshy, and of the size of nutmegs; whereof one is full and hard, and the other wrinkled and spongy. At first it sends forth six or seven leaves, that are long, pretty broad, smooth, and like those of the flower-de-luce, but smaller, and generally marked at the top with brownish red spots. The stalk rises to the height of a foot, and is round, streaked and encompassed with one or two leaves; on the top there is a long spike of beautiful purple flowers, that are whitish towards the center, and sprinkled with specks of a deeper purple. Each flower is composed of six unequal petals, of which the five uppermost compose a sort of helmet; and the lower petal, which is larger than the rest, has a sort of a head or helmet at the top, and terminates in a tail, or sharp point like a spur. The calyx becomes a fruit, with three sides, and is divided into three cells, containing many small seeds. It flowers towards the end of April, and the beginning of May, and is found in many parts of England.

ORCHIS LATIFOLIA, *seu* MAJOR, *Dog's-stones*. This plant has a root composed of two bulbs, or fleshy tubercles, but larger, and in the shape of large olives. The stalk rises near the height of a cubit, and has long pyramidal flowers at the top, which are large and beautiful, whitish within, and sprinkled with purple spots; but they are reddish on the outside, and represent a man in armour, without hands or feet. The leaves are big, long, and broad, and are roundish at first when they rise out of the earth in November. The seed is like that of the former, and flowers in May. There are several other sorts of these plants, the under part of whose flower represents several shapes, as a naked man, a butterfly, a fly, a drone, a pigeon, an ape, a lizard, and a parrot; and these all grow wild in several parts of England; but deserve a place in every good garden. The Turks have a preparation of a certain root that is called lalep, which they make use of to recover their strength. It is supposed to be a kind of orchis, and the following preparation of this root will answer the same purposes. Take the roots or bulbs of orchis, that are well nourished, and after they are skinned, throw them into cold water; after they have been there some hours, boil them in a sufficient quantity of water, and then strain them; this done, put them on a string, and dry them in the air; this is best done in a dry hot season. They will become transparent, very hard, and will resemble pieces of gum trangacanth. If they are kept in a dry place they will always remain good, and may at any time be reduced to a very fine powder. A scruple of this, put by little and little into boiling water, will entirely melt, and will be sufficient for a pint of water; it may be rendered more agreeable, by putting in a little sugar, and is exceeding useful when mixed with milk, in all diseases of the breast; for it is very emollient, and will abate the sharpness of the humours; it is excellent in consumptions, and bloody fluxes of the bilious kind.

OREOCELINUM, *sive* APIUM MONTANUM, *Mountain Parsley*, has a root consisting of many fibres, adhering to one head, which creep greatly in the earth; they are blackish on the outside.

ſide, white within, and are full of mucilaginous juice. It has a ſingle ferulaceous ſtalk, that riſes to the height of four or five feet, which is furrowed, and divided into wings. The leaves proceed as well from the root as the ſtalk, and are large, but like thoſe of the common parſley, only they are more firm and ſmooth. The flowers grow in umbels at the top of the ſtalks and branches, and are ſmall, whitiſh, and conſiſt of five purpliſh petals, diſpoſed in the form of a roſe. Theſe are ſucceeded by a fruit, which was the calyx of the flower, compoſed of two ſeeds, that are oval, flattiſh, radiated on the back, and bordered with a membranous leaf, of a reddiſh colour. It grows in mountainous places, where there are paſtures.

OREOCELINUM, *ſive* APIUM MONTANUM MINUS, *ſmaller mountain Parſley*, has a pretty thick, ſoft root, that is fibrous on the upper part, and white both within and without; the ſtalks riſes to the height of a cubit and upwards, and is pretty thick, firm, furrowed, knotted by intervals, reddiſh and branched. The leaves lie on the ground, and are like thoſe of garden parſley. The flowers grow in umbels on the top of the ſtalk and branches, and are of a white colour. The ſeeds that ſucceed them have a more acrid taſte than the leaves. It delights in mountainous and ſandy places, and flowers in July and Auguſt. The ſeeds are accounted an aperient, and proper to open the obſtructions of the liver and ſpleen; they are alſo diuretic, and free the kidneys from gravel; but they are ſeldom uſed among us.

ORIGANUM VULGARE, *wild Marjoram*, has a ſlender, woody, fibrous root, creeping obliquely into the ground, which ſends forth ſeveral ſtalks, that riſe to the height of two or three feet, and are hard, ſquare, and downy. The largeſt leaves reſemble thoſe of common calamint, and the leſſer thoſe of marjoram; they are downy, have an agreeable ſmell, and an acrid, aromatic taſte. The flowers are collected into ſcaly ſpikes, and are labiated, conſiſting of a ſingle petal, whoſe upper lip is erect, roundiſh, and divided into two ſegments, but the lower into three. The piſtil ariſes from the calyx, and is fixed in the back part of the flower like a nail; it is attended with four embryoes, and turns into as many ſmall ſeeds, contained in a capſula, that was the calyx of the flower. It grows wild on dry chalky hills, and on gravelly ſoil, in ſeveral parts of England, and it flowers in the ſummer. Wild marjoram is diuretic, and diaphoretic, and may be uſed in the manner of tea in the aſthma, and a violent cough. The powder of the leaves and the flowers dried in the ſhade are cephalic, and being taken as ſnuff, will make the noſe run conſiderably. It helps digeſtion, diſcuſſes wind, and is employed externally in baths for the feet.

ORNITHOPODIUM MAJUS, *the greater Bird's-foot*, has a ſmall, white, ſingle, fibrous root, accompanied with ſeveral grains or tubercles, with ſeveral flexible, weak, branched, round, hairy ſtalks, that ſeem to creep on the ground. The leaves are leſs than thoſe of the Baſtard Sena, and the flowers are ſmall, papilionaceous, and diſpoſed in ſpikes on the top of the branches; the piſtil ariſes out of the calyx, which afterwards becomes a hooked jointed pod, that is generally undulated, and at every joint there is a round ſeed; and ſeveral of theſe pods grow together in ſuch a manner, as to reſemble the foot of a bird. It flowers in ſummer, and generally in June, and delights in dry cultivated places. The whole plant is accounted aperient and diuretic, and when powdered, the doſe is a drachm in a glaſs of white wine; but it is not now in uſe.

ORYZA, *Rice*, has a root like that of wheat, and furrowed ſtalks, that riſe to the height of three or four feet, which are thicker and ſtronger than thoſe of wheat or barley, and knotted by intervals. The leaves are like thoſe of reeds in ſhape, but they are fleſhy like leeks. The flowers which grow on the tops are of a purple colour, and are diſpoſed into panicles. The ſeeds are almoſt oval, white, tranſparent, hard, and are contained in a yellowiſh, rough, furrowed, angular, downy capſula, ſomewhat like barley; they are placed alternately on each ſide of the branches. This plant is cultivated in hot countries, in moiſt marſhy land, and the uſe of the ſeeds is principally for food. However, they deſtroy the acrimony of the humours, and are good in fluxes of the belly. Rice ſerves inſtead of bread in moſt of the eaſtern countries, and is their principal nouriſhment. It is now planted in South Carolina, where great quantities have been produced, and as good as in any other part of the world. It is chiefly uſed here for puddings, and to make rice-milk.

PÆONIA MAS, *Male Peony*, has an oblong, thick, tuberoſe root, brown without, and pale within, and is often divided into ſeveral branches; it ſends forth ſtalks to the height of two or three feet, that are a little reddiſh, and divided into branches. The leaves are large, and compoſed of ſeveral other leaves, almoſt like thoſe of the hazel tree; but they are broader and thicker, and of a ſhining, browniſh green colour; they are alſo covered underneath with a down, and have long reddiſh pedicles. The flowers grow on the tops of the ſtalks, and are large, conſiſting of ſeveral petals, that expand in the form of a roſe, ſometimes of a purple colour, and ſometimes of a paliſh red. The calyx is compoſed of five leaves, and in the middle there are purple ſtamina with ſaffron coloured apices. They are ſucceeded by fruit, compoſed of ſeveral ſmall, white, downy, ſhining, crooked horns, that are open when they are ripe, and contain many globulous ſeeds, that are red at firſt, and afterwards of a dark blue or black. It flowers at the beginning of May, and they fall off ſoon afterwards. It is cultivated in gardens for the ſake of the roots, which are uſed in medicine. They are propagated by parting the roots, and are extremely hardy, for they will grow in any ſoil or ſituation: the beſt ſeaſon for this is in the beginning of September.

PÆONIA FŒMINA, *female Peony*, has a root compoſed of ſeveral tubercles, connected together with fibres, and ſends forth a tall ſtalk, that has ſcarce any redneſs at all; the leaves are of a greeniſh pale colour above, and whitiſh, and a little downy underneath. The flowers are like thoſe of the former, but neither they nor the fruit are ſo large. This is a very common ſort, and is to be met with almoſt every where in gardens. The *Male Peony* is principally uſed in medicine, and the roots and ſeeds have been thought by many to be a ſpecific againſt the falling-ſickneſs, convulſions, and the palſy. They are reduced to powder, after they have been dried in the ſhade, and then the doſe is a drachm or two; or an ounce of the roots is given in decoction, while they are freſh.

PALIURUS, *Chriſt's-thorn*, has a hard woody root, with a ſtem that grows ſo high, that it ſometimes deſerves the name of a tree. The branches are long and thorny, but thoſe that are near the leaves are ſmaller, and not ſo prickly as in other places. The leaves are almoſt round, pointed, and of a dark green, with a reddiſh caſt. The flowers are ſmall, yellow, grow on the tops of the branches, and are generally compoſed of five petals, in the form of a roſe. The piſtil ariſes from the flower cup, which turns to a fruit almoſt in the ſhape of a bonnet, having a ſhell that is nearly globular, divided into three cells, on each of which there is a ſingle roundiſh ſeed. This ſhrub grows wild in the hedges of Italy, Spain, Portugal, and the ſouth of France, from whence its ſeeds are procured. It flowers in May and June, and

and the fruit is ripe in the autumn. It is called *Chriſt's-thorn*, becauſe they ſuppoſe his crown of thorns was made of the branches of this tree. It may be propagated by laying down the tender branches in the ſpring, which will take root in a year's time; the beſt ſeaſon for tranſplanting them is in autumn, ſoon after the leaves begin to decay. The fruit is ſaid to be diuretic, and to help the moiſt aſthma, by promoting expectoration; but it is not in uſe among us.

PAPAVER CORNUTUM, *ſeu* CORNICULATUM, *Yellow horned Poppy*, has a root as thick as one's finger, which is long, blackiſh, and full of a yellow juice, as well as all the plant, which has a particular taſte and ſmell. It ſends forth long, fleſhy, thick, downy leaves, cut deeply on the ſides, and dentated on the edges; the colour is of a ſea-green, and they lie upon the ground, where they continue all winter. The ſtalk, which does not riſe till the ſecond year, is ſtrong, ſolid, knotty, ſmooth, and divided into ſeveral branches, ſending forth leaves from the knots that are ſmaller, and not ſo jagged as thoſe below. The flowers grow on the top of the ſtalks and branches, and are as large as thoſe of garden poppies, being each compoſed of four yellow petals, placed in the form of a roſe, in the middle of which there are a great number of ſtamina of the ſame colour. They are ſucceeded by fruit, or a ſort of pods, a ſpan in length, or longer, and are very ſlender and crooked like horns; they are rough to the touch, blunt at the ends, and contain a double row of ſeeds, ſeparated by a partition, and as round as thoſe of the common poppy, and very black. It grows wild on the ſea-ſhore, and in ſandy maritime places. If it be ſown in gardens in autumn, it will come up in the ſpring, and will flower in June and July, and the pod will be ripe in Auguſt. This plant is accounted diuretic, and very good for thoſe who make thick urine: in Portugal they give an infuſion of half a handful of the leaves in a glaſs of white wine for the gravel and ſtone; but it has not been brought into uſe in England.

PAPAVER RHÆAS, *the greater wild Poppy*, or *Comroſe*, has a ſingle white root, as thick as one's little finger, furniſhed with a few fibres, and has a bitter taſte. It ſends forth ſeveral ſtalks, to the height of a cubit, or upwards, which are round, ſolid, hairy, and branched; the leaves are jagged like thoſe of ſuccory, hairy, of a browniſh green, and dentated on the edges. The flowers grow on the top of the ſtalks and branches, are compoſed of four large, thin, deep, red leaves, which are ready to fall off with each blaſt of wind; theſe are ſucceeded by ſmall heads of the ſize of hazel nuts, that are oblong, ſmooth, and much of the ſame ſhape with thoſe of the garden poppy. They are divided into ſeveral cells, containing blackiſh, or dark red ſeeds. This plant grows almoſt every where in the fields, eſpecially among corn. It flowers in May, June, and July. The flowers are made uſe of in medicine, and are in ſome meaſure anodyne and narcotic. They are good in acrimonious catarrhs, roughneſs of the face, and in commotions of the fluids. They may be drank as tea, and are of very great ſervice in all caſes where a gentle opiate is uſeful; there is a ſyrup made with theſe flowers, kept in the ſhops, which will ſerve for the above purpoſes.

PAPAVER HORTENSE NIGRO SEMINE, *the leſſer Garden Poppy*, has a root about the thickneſs of one's little finger, full of a bitteriſh milk, as well as the whole plant. It ſends forth an upright ſtalk, to the height of two cubits, which is generally ſmooth, though ſometimes a little hairy, and the leaves are oblong, broad, dentated, curled, and of a ſea green colour. The flowers grow on the top of the ſtalks and branches, and are large, in the ſhape of a roſe, of a reddiſh colour, ſometimes ſingle, and ſometimes double; as alſo ſometimes fringed on the edge, and ſometimes not. The calyx conſiſts of two leaves, that generally fall off as ſoon as the flower is blown. It is ſucceeded by roundiſh heads of different ſizes, crowned with a ſort of cover, in the form of a ſtar, and contains in their cavities or membranous cells, ſeeds of a blackiſh colour. There is a great variety of theſe plants, as well in colour as ſhape, that are ſown in gardens for the ſake of their flowers; but they are not ſo much uſed in medicine as the white poppy. They may be all propagated by the ſeeds ſown in autumn, and will flower in May and June, and ſometimes during all the ſummer.

The heads of the ſtalks of theſe plants contain a milky juice, which may be collected in a conſiderable quantity, by ſlightly wounding them when almoſt ripe; this, expoſed for a few days to the air, thickens into a clammy maſs of the ſame quality as opium, but weaker. Poppy heads boiled in water communicate their virtues to it very freely; and, when the liquor is ſtrongly preſſed out, clarified with the whites of eggs, and evaporated to a due conſiſtence, yields an extract that weighs about one ſixth of the weight of the heads. Some count it more ſafe than opium, but it muſt be given in a double doſe.

PARIETARIA, *Pellitory of the wall*, has a fibrous reddiſh root, with ſeveral ſtalks that riſe to the height of two feet, which are round, reddiſh, brittle, and branched. The leaves are oblong, and are pointed, downy, of a browniſh green colour, ſhining, rough, and apt to hang to the cloaths of paſſengers; they have long pedicles, and are placed alternately on the ſtalks. The flower has no petals, but has generally four ſtamina, that riſe out of a flower-cup, divided into four parts, which is ſometimes in the ſhape of a bell, and ſometimes like that of a funnel; they ſurround a piſtil that generally turns to an oblong ſeed, contained in a capſula that was in the cup of the flower. It grows upon old walls and buildings in great plenty, and flowers in May. It is looked upon as aperient, temperating and reſolvent, whether taken inwardly or applied outwardly. The doſe, in infuſion, is from one handful to three, and of the juice from one ounce to three. It is accounted one of the five emollient herbs, and is made uſe of occaſionally for that intention, particularly in decoctions, fomentations and clyſters.

PASTINACA, *Parſnep*, or *the Garden Parſnep*, has a long, thick, fleſhy root, of a yellowiſh colour, in the middle of which there is a nerve, that runs throughout its whole length. The ſtalk riſes to the height of three or four feet, and is upright, firm, furrowed, hollow, and branched. The leaves are large, and compoſed of other leaves, that are villous, dentated on the edges, winged, and are placed on a pretty large rib; they are of a browniſh green, and placed by pairs along the rib, which is terminated by a ſingle leaf. The flowers grow on the tops of the ſtalks and branches in large umbels, and each flower has four yellow petals, placed in the form of a roſe; theſe are ſucceeded by large, oval, flattiſh, ſlightly furrowed ſeeds, bordered by a ſmall membranous leaf, reſembling thoſe of angelica. The root of this plant is of great uſe as food, for which it is chiefly employed. It flowers in July and Auguſt, the ſecond year, after it has been ſown. The taſte of parſneps is well known, and they are more nouriſhing than carrots, though ſome have a natural averſion to their uſe.

PASTINACA SYLVESTRIS, *wild Parſnep*, has a white ſingle root, that has ſometimes large fibres, and has the ſame taſte and ſmell as the garden parſnep. The ſtalk is two or three cubits high, and is upright,

upright, ſtiff, furrowed, hairy, hollow within, branched, and has leaves alternately placed like the former; but they are ſmaller, of a deeper green, and are ſometimes hairy, eſpecially towards the root. The flowers grow in umbels, and are ſmall, yellow, and compoſed of five petals each; theſe are ſucceeded by double ſeeds, as in the former. It grows in uncultivated places, in dry fields, and upon hills, and flowers in the ſummer. Some make uſe of it as an aliment, and pretend, when the ſeeds are ſown in the garden, they will produce as good parſneps as the garden ſort. Both the ſeeds and root have been commended as a remedy againſt agues; but they often fail.

PERIPOLCA, *Virginian ſilk*, or *climbing dog's bane*, of Montpellier, has a root almoſt as thick as one's finger, that is long, white, fibrous and creeping; as alſo full of milky juice, as well as the reſt of the plant. The ſtalks riſe to the height of two cubits, and are ſlender, round, branched, pliant, and creep upon any tree that ſtands near it. The leaves ſtand oppoſite to each other, are large, thick, whitiſh, pointed, and cut in the form of a croſs, near the pedicle, and are full of a milky juice. The flowers proceed from the places where the leaves join to the ſtalk, conſiſting of a ſingle petal that is white, and cut into five ſegments in the form of a ſtar. The piſtil is ſucceeded by a fruit, ſo like that of dog's bane, as not to be diſtinguiſhed from it; and when it is opened, it diſcovers a downy ſubſtance, under which the ſeeds lie. It grows wild about Montpellier, but with us it is propagated in gardens, by laying down the branches at the ſpring of the year; it flowers in June, July and Auguſt; and the milky juice being inſpiſſated over the fire, becomes blackiſh, and greatly reſembles ſcamony, but is not ſo purging; and therefore requires a large doſe to procure that effect.

PERSICARIA MITIS, *dead or ſpotted Arſe Smart*, has a ſlender, oblique, woody, fibrous root, difficult to break, and ſends forth ſtalks to the height of a foot, that are round, hollow, reddiſh, branched and knotted. The leaves are like thoſe of the peach-tree, and ſometimes marked with blackiſh ſpots. The flowers grow in ſpikes, and conſiſt of ſingle petals, cut into five ſegments, and are without a calyx; but there are five ſtamina that are purple and ſhining, though ſometimes whitiſh; they are ſucceeded by oval, flattiſh, pointed, ſmooth, blackiſh ſeeds. It has not ſo acrid a taſte as the following, and is a little tart. It grows in watery, marſhy places, as well as in moiſt ditches, almoſt every where, and flowers in July and Auguſt. It is looked upon as aſtringent, deterſive, and vulnerary, and its decoction is ſaid to be good in fluxes of the belly, and for ulcers of the inteſtines.

PERSICARIA URENS, *biting Arſe Smart*, has a ſmall, ſingle, woody, white, fibrous root, that ſends forth ſeveral ſtalks to the height of a foot and a half, which are firm, round, ſmooth, knotty, branched, ſometimes reddiſh, and ſometimes of a greeniſh yellow. The leaves proceed from the knots of the ſtalk, which they embrace by their membranous appendages, and are of a pale green, and like thoſe of the peach-tree. The flowers grow in long ſpikes on the top of the ſtalk and branches, and conſiſt of a ſingle petal, cut into five ſegments; there is no calyx, but there are five ſtamina generally of a purple colour, which are ſucceeded by pretty large ſeeds, ſomewhat triangular, ſhining and blackiſh. It has an acrid biting taſte, like pepper, and grows in watery marſhy places on the ſides of brooks and ditches; it flowers in July and Auguſt. It is ſaid to be cleanſing and vulnerary, and to be good in the dropſy, jaundice, and obſtructions in the viſcera. Its diſtilled water, given to two or three ounces, is by ſome accounted a ſpecific againſt the gravel. All authors agree, that this herb, applied to old ulcers, eats away proud fleſh, and cleanſes and dries them; being applied as a cataplaſm to the bruiſes of horſes, it reſolves the coagulated blood; if the wounds and ulcers are waſhed with the juice, the flies will never come near them.

PERVINCA, *five* CLEMATIS DAPHNOIDES, *Periwinckle*, has a fibrous root, with ſlender, long, round, green, knotty, creeping, climbing ſtalks; the leaves are oblong, green, ſmooth, and placed by pairs, oppoſite to each other, and are of a bitter ſtyptic taſte. The flower cup conſiſts of a ſingle leaf, divided into five long, narrow ſegments; and the flower of a ſingle petal is cut into five ſegments, that expand into the form of a ſalver. The piſtil is fixed in the loweſt part of the flower, like a nail, and turns to a fruit compoſed of two huſks or pods, which contain oblong, cylindrical, furrowed ſeeds. Some call it Ground Laurel, becauſe its leaves reſemble thoſe of that tree. This plant is an evergreen, and is propagated by the branches that take root in the earth. It flowers in the ſpring, and continues to do the ſame for a long while. It is accounted vulnerary, and is found almoſt every where, in hedges, and among ſhrubs.

PERVINCA LATIFOLIA, *ſive* FLORE CÆRULEO, *greater Periwinckle*, with a blue flower, has a fibrous creeping root, with ſeveral thick, round, knotty, green, creeping branches. The leaves are placed by pairs, facing each other, along the ſtalks, and are of a ſhining green, with a bitter acrimonious diſagreeable taſte. The flowers, like the former, are generally blue, though ſometimes white and without ſmell; it differs from the former only in being larger in all its parts. It is ſaid to be vulnerary, aſtringent, and febrifuge, and is given to abate all kinds of bleedings.

PETASITES, *Butter Bur*, has a thick, long root, brown without, and white within; the ſtalks are thick, hollow, and hairy, and riſe to the height of half a foot; the leaves are ſmall, narrow, and pointed; and the flowers grow at the end of the ſtalks in tufts, and conſiſt of many florets, divided into ſeveral parts; they are contained in a cylindrical calyx, cloven almoſt down to the bottom, into many ſegments. There is a ſingle embryo that becomes a ſeed, furniſhed with down. The flowers appear before the leaves, which are very broad, and have a hollow in the middle, and round that a hollow expanſion in ſuch a manner, that they reſemble bonnets. It grows in moiſt places on the ſides of rivers, brooks, lakes, and ponds, and flowers early in the ſpring. In ſome places, the leaves grow to the height of a man, and continue all the winter. Some authors have confounded this plant with the great burdock, becauſe the leaves have ſome reſemblance to each other. The root, which is the part made uſe of is aperient, reſolvent, hyſteric, and vulnerary, and brings up phlegm in aſthmas and obſtinate coughs.

PETROSELINUM, *Parſley*, has a ſingle root as thick as one's finger, and often much thicker, that is furniſhed with a few fibres; it is whitiſh, long, and good to eat. The ſtalks ſometimes grow to the height of three or four feet, and are round, furrowed, knotted, and branched. The leaves are compoſed of others that are cut into jags, are green, and have long pedicles. The flowers grow on the top in umbels, and are compoſed of five pale petals, diſpoſed in the form of a roſe; theſe are ſucceeded by ſeeds that are joined by pairs, and are ſlender, furrowed, grey, and roundiſh at the back. It is cultivated in gardens, and will endure all ſorts of weather. It delights in a moiſt ground, for which reaſon it ſhould be often watered. It ſends forth a ſtalk

a ſtalk the ſecond year after it is ſown, flowers in June and July, and the ſeed is ripe in Auguſt. It is aperient, and is ſaid to open obſtructions; but its chief uſe is only as a kitchen herb. The ſeed is one of the four hot ſeeds, is attenuating and diuretic, and is ſaid to be good in the gravel and dropſy.

PETROSELINUM MACEDONICUM, *Macedonian Parſley*, has a long, thick, white, wrinkled, woody root, which ſends forth a ſtalk to the height of a foot and a half, that is thick, hairy, and branched. The leaves reſemble thoſe of garden parſley; but are more large, a little more cut, and dentated. The flowers grow on the top of the branches in umbels, are whitiſh, and compoſed of five petals in the form of a roſe. They are ſucceeded by ſlender, hairy, oblong, aromatic ſeeds, of an acrid taſte. It grows wild in Macedonia, and was greatly valued by the ancients; but is here cultivated in gardens. The ſeed only is in uſe, and has the ſame virtues as that of common parſley, but ſtronger, and is an ingredient of Venice treacle.

PHASEOLUS, the *Kidney bean plant*, has a ſlender, fibrous root, and ſends forth a long, round, branched, climbing ſtalk. The leaves come out by threes, in the manner of trefoil, and are large, pointed at the end, fleſhy, ſmooth, and almoſt like thoſe of ivy, with long, green pedicles. The flowers are papilionaceous, and a piſtil riſes out of the flower cup, which turns to a long pod full of ſeeds, generally ſhaped like a kidney. The uſe of kidney beans is well known, and therefore need not be mentioned here. They are opening, emollient, reſolvent, and promote urine, and generally agree with moſt conſtitutions. The meal of the ſeed is ſometimes mixed in emollient cataplaſms.

PHILLYREA, *Mock Privet*, has a thick ſtrong root that runs deep into the ground, and the ſtems riſe to eight or ten feet high, and are covered with a white or aſh coloured bark, a little wrinkled. It is an ever-green ſhrub, with leaves like thoſe of the privet, and a flower that conſiſts of a ſingle petal in the ſhape of a bell, cut into four parts at the top; the colour is a whitiſh green or herbaceous. The piſtil that riſes from the center of the calyx afterwards turns to a ſpherical fruit or berry, that is black when ripe, and contains one ſeed. They have been formerly in great requeſt, for hedges and to cover walls; but they are moſt proper for wilderneſſes. It flowers in May and June, and the fruit is ripe in September. It is of little or no uſe in medicine.

PHYTOLLACA, *American night ſhade*, has a root a foot long, that ſometimes grows to the thickneſs of a man's thigh, which is white, and perennial. The ſtalk riſes to the height of five or ſix feet, and is thick, round, ſtrong, reddiſh, and divided into ſeveral branches. The leaves are placed irregularly, and are large, veinous, ſoft, and of a pale green, though ſometimes reddiſh; the ſhape is like thoſe of common night ſhade. The flowers grow in bunches, each of which conſiſts of ſeveral petals, placed in a circular order, which are of a pale red colour. The piſtil riſes from the center, and the flower is ſucceeded by a ſoft fruit or berry, that is roundiſh, full of juice, and like a button flatted above and below; when it is ripe, it is of a browniſh red colour; and contains ſeveral round black ſeeds, placed orbicularly. It is very common in our northern American plantations, and is cultivated in England, for the beauty of its flowers. It may be propagated by ſowing the ſeeds in the ſpring, upon a bed of light rich earth; and when the plants are come up, they ſhould be moved into the borders of large gardens, allowing them room enough to grow, for they will become very large. The berries are full of a purple juice, which gives a fine tincture to paper; but it will not laſt long.

PILOSELLA, *common Mouſe Ear*, has a ſhort, ſlender root, furniſhed with fibres, that ſend out ſlender, hairy ſtalks, which creep upon the ground, where they take root again. The leaves are oblong and roundiſh at the end, like the ears of a mouſe, from whence it has its name, and they are covered with hair; they are green above, but downy below, and have an aſtringent taſte. The flowers are only a ſingle floret, of a yellow colour, with a ſcaly ſingle calyx, which is ſucceeded by ſlender, black, downy ſeeds, in the ſhape of a wedge. It grows in dry barren land, and on the ſides of highways. It flowers in May, June, and July. It is very bitter and accounted aſtringent, vulnerary, and deterſive. The extract, given to two drachms, is ſaid to be very uſeful in internal ulcers; likewiſe eight ounces of the infuſion of this plant, in white wine, is boaſted of as an infallible remedy againſt the ague, given an hour before the fit.

PIMPINELLA, *Burnet, or Pimpernel Parſley*, has a round, ſlender root, divided into ſeveral reddiſh branches, among which are ſometimes found certain red grains, which they call wild cochineal, and which are uſeful in dying. The ſtalks are red, angular and branched; the leaves are oblong or roundiſh, dentated on the edges, and placed by pairs on the ribs. The flowers grow on the ends of the ſtalks, in round heads, and conſiſt of a ſingle petal, divided into four parts, in the form of a roſe, and of a purple colour; in the middle there is a tuft of long ſtamina, the flowers are of two ſorts, the one barren, and furniſhed with ſtamina, the other fruitful, that have a piſtil. This is ſucceeded by a quadrangular fruit generally pointed at both ends, and of an aſh colour when ripe, containing oblong, ſlender, reddiſh brown ſeeds, with an aſtringent and ſomewhat bitter taſte. It grows wild in many parts of England, particularly on dry chalky land, and on hills and mountains. It is ſaid to be detergent, vulnerary, and diuretic, and ſome pretend it ſtops hæmorrhages, as well internal as external, either given in decoction or powder. The doſe, in infuſion or decoction, is from half a handful to two handfuls, and of the juice, from an ounce to three ounces, or by ſpoonfuls.

PINGUICULA, *Butter wort*, has a fibrous root, that ſends forth ſix or ſeven leaves, and ſometimes more; they lie upon the ground, are of a yellowiſh green, and ſomewhat thick and ſhining, as if butter had been rubbed over them; they are two inches long, about one broad, ſomewhat blunt at the extremities, and even on the edges. In the middle a pedicle ariſes as high as one's hand, at the top of which is a purple violet, or white flower, like that of a violet; but it conſiſts of a ſingle petal, divided into two lips, and ſub-divided into ſeveral parts; but, at the bottom, it terminates in a ſpur. It is ſucceeded by a fruit or ſhell, whoſe lower part is incloſed in the calyx, which when open diſcovers a button, containing ſeveral ſmall almoſt round ſeeds. It grows in meadows, and other moiſt and marſhy places, and flowers in the ſpring. It is vulnerary, and heals green wounds very ſoon; and the juice makes an excellent liniment for chaps of the nipples.

PIPER INDICUM, *ſive* CAPSICUM, *Guiney Pepper*, has a ſhort, ſlender root, furniſhed on each ſide with a great number of fibres, which ſend forth a ſtalk to the height of a foot and a half, and upwards, eſpecially in hot countries; this is angular, hard, hairy, and branched; the leaves are long, pointed, and broader than thoſe of arſe-ſmart; they are ſomewhat thick and fleſhy, of a greeniſh brown, and without hair. The flowers, which grow under the joints of the leaves, where they adhere to the branches, are roſaceous, and of a whitiſh colour, very much reſembling thoſe of

common nightſhade, but larger, and ſupported by a pretty long, fleſhy, red pedicle. They are ſucceeded by a long capſula, as thick as one's thumb, ſtrait, and formed of a fleſhy, ſhining, poliſhed ſkin, which is green at firſt, afterwards yellow, and then red; it is divided into two or three cells, that contain many flattiſh ſeeds of a whitiſh colour, inclining to yellow, and generally of the ſhape of kidneys. It grows naturally in the Indies, and particularly in Guiney and Braſil. It is eaſily propagated by ſeeds in hot countries, and there are ſeveral ſorts of it; as the capſicum with long hanging pods; that with long pods which turn up at the end; the broad leaved capſicum, with long ſtreaked pods, commonly called bonnet pepper; African capſicum, with rough hanging pods; African capſicum, with pyramidal rough pods, generally growing erect; capſicum with long hanging pods that are not hot; capſicum with red pods, in the ſhape of hearts, generally hanging downwards; capſicum with pyramidal, thick, red pods, generally growing upright; upright olive ſhaped capſicum; capſicum with ſmall, red pods, growing upright, called Barbary pepper; capſicum with ſmall, round, very hot pods, named bird pepper; American capſicum, with round ſhaped fruit, broad leaves; American capſicum, with oblong white pods, growing erect, and capſicum with large, rough, red pods, generally hanging downwards. There are two or three other ſorts, but theſe are the principal, and they are ſown in many curious gardens, in hot beds. They are pretty hardy, and may be planted abroad about the middle of June. The inhabitants of the Weſt Indies make a great uſe of the bird pepper, which they dry, reduce to a powder, and mix with other ingredients. They ſend ſome of the pots to England, under the name of Cayan pepper, and this is in great eſteem by ſome. They likewiſe eat the fruits of ſome of theſe kind raw, but they will burn the throats of thoſe that are not uſed to them. The laſt makes one of the fineſt and wholeſomeſt pickles in the world, if they are gathered before the ſkins grow tough. It is at preſent of no uſe in phyſic.

PISUM, *the Pea Plant*, has a ſlender, fibrous root, that ſends forth long, hollow, brittle ſtalks, of a ſea green colour, that would lie upon the ground if they were not ſupported by props. The leaves are oblong, of the ſame colour as the ſtalks, and ſome are ſo placed that the ſtalks ſeem to run through them, while others grow by pairs on the ribs, that are terminated by tendrils or claſpers, which lay hold of every thing they meet with; two or three flowers proceed together from the places where the leaves join to the ſtalks, and are papilionaceous and white. The piſtil is ſucceeded by a long pod, full of roundiſh ſeeds, which are very well known. There are ſeveral ſorts of peas, as the great garden pea, with white flowers and fruit; the hotſpur pea; the dwarf pea, the French dwarf pea; the pea with an eſculent huſk, the ſickle pea, the common white pea, the green rouncival pea, the grey pea, the marble rouncival pea, the roſe pea, or brown pea, the Spaniſh morotto pea, the marrowfat pea, the union pea, the Engliſh ſea pea, and the pig pea. The Engliſh ſea pea is found wild on the ſhores of Suſſex, and ſeveral other counties in England; and in times of ſcarcity they have been a very great help to poor people. The propagating of peas is ſo well known, that the manner of it needs not to be taken notice of here. The uſe of peas is alſo very well known, they being common food in all parts of England; but they are windy, and do not very well agree with weak ſtomachs. Green peas are very good eaten raw, for thoſe that have the ſea ſcurvy.

PLANTAGO MAJOR, *great Plantain*, has a ſhort root, as thick as one's finger, and is furniſhed with whitiſh fibres on the ſides; it ſends forth large ſhining leaves, ſeldom dentated on the edges, and have each eight nerves, that run throughout their whole length. The ſtalk, which riſes from the middle of the leaves to about a foot in height, is round, hard to break, and ſometimes reddiſh, as well as a little hairy. There grows on the top an oblong point, with ſmall whitiſh flowers; each of theſe is a pipe, cloſe ſhut at the bottom, open at the top, and cut into four parts, in which are ſeveral ſtamina. It is ſucceeded by a fruit, with a thick, oval, pointed ſhell, that opens croſſways, and contains ſeveral ſmall, oval, reddiſh ſeeds. This plant is very common, and grows almoſt every where. It flowers in May and June, and the fruit is ripe in Auguſt.

There is another ſort of plantain, that has a thick root, which ſeems to be bit off at the end; the leaves are narrower than thoſe of the former, and contain only five nerves; there are likewiſe a third that contains but three, and this is called the Leſſer Plantain. They all have the ſame medicinal uſes, and the leaves are bitter and aſtringent. It is accounted reſolvent and febrifuge; for the juice being given from two to four ounces, in the beginning of intermitting fevers, often cures them. A ptiſan, made with the leaves of plantain, is good in the bloody-flux, ſpitting of blood, and all other hæmorrhages whatever. The decoction is an excellent gargle in ulcers of the mouth; and with lime-water it cures ulcers of the legs. Made into an ointment, with freſh butter, it is ſaid to cure the piles.

POLYGONATUM, *Solomon's ſeal*, has a long root, as thick as one's finger, and full of large knots or tubercles, of a whitiſh colour, and furniſhed with many fibres. The ſtalks riſe to the height of a foot and a half, and are round, ſmooth, and without branches. The leaves are placed alternately, and are large, oblong, full of nerves, and of a browniſh, ſhining green above, but of a ſea-green or bluiſh colour below. The flowers grow in the places where the leaves join to the ſtalks, ſometimes ſingle, and ſometimes double and treble; they are in the ſhape of a bell, cut at the top into ſix ſegments, but they have no calyx; the colour is white, except the edges, which are greeniſh. The embryo, which is ſeated on the center of the flower, becomes a berry, like thoſe of ivy; it is a little ſoft, green, purple, or blackiſh, and generally contains three large ſeeds, like thoſe of vetches. It is very common in all parts of England, and grows in ſhady places by the ſides of hedges, and in woods and foreſts. There are ſeveral ſorts of this plant, which may eaſily be propagated, by parting the roots in the ſpring, before they begin to ſhoot; they ſhould be planted in freſh, light earth, that is not very rich, where they will thrive exceeding well. It flowers in May and June, and the berries are ripe in Auguſt; but the root is chiefly uſed in medicine. All authors look upon this plant as aſtringent and vulnerary, and it has been often uſed for the cure of ruptures; but it is now intirely neglected among us.

POLYPODIUM, *Polypody, or Oak Fern*, has a root ſix inches in length, and almoſt as thick as a man's little finger, that creeps along the ſurface of the ground; it is full of tubercles or warts, and is eaſily broken. It ſends forth leaves, which are like thoſe of male fern, but much leſs; they are deeply cut almoſt to the rib, into long narrow ſegments, which are covered on the back with a ſort of reddiſh powder. This, examined through a microſcope, appears to be ſpherical, membranous ſhells, which open, and let fall ſmall yellow ſeeds, in the form of a kidney. It is a capillary plant, and conſequently bears no flowers; it grows in foreſts, valleys, and among ſtones covered with moſs, as well as on the trunks of old trees. The root only is uſed in medicine,

dicine, and that is accounted beſt that is found upon oaks. It is green all the year, and in April it ſends forth freſh leaves. The ancients accounted this root to be purgative; but it does not ſo much looſen the belly, or at leaſt very weakly. Some affirm, that it opens obſtructions of the viſcera; but the beſt authors are not agreed in its virtues, though it has been much uſed in medicine.

POPULUS NIGRA, *the black Poplar tree*, has a root that ſpreads very deep in the earth, and grows to a tall tree, with leaves that are almoſt round, and cut on the edges. They are of a blackiſh colour, and always tremble, though there is no wind. Some bear no flowers or fruit, except catkins, which conſiſt of many pointed ſmall leaves; for the fruit grows on thoſe trees that bear no catkins, and they conſiſt of ſeveral ſmall leaves, under which lies a bell, containing the embryo; this turns to a membranaceous ſpiked pod, that opens two ways, and is full of downy ſeeds. In the beginning of the ſpring it produces many buds, about the ſize of capers, which are oblong, pointed, of a greeniſh yellow, and full of a clammy juice, which ſticks to the fingers of thoſe that touch them. It grows in moiſt watery places, on the ſides of brooks and rivers; the buds appear in April, and the catkins in May or June. The buds are only made uſe of in medicine, and a tincture may be extracted from them with ſpirits of wine, which, according to Tournefort, is excellent to ſtop inveterate fluxes of the belly, and to heal internal ulcers. The doſe is a drachm morning and evening, in a ſpoonful of hot broth. They are alſo employed in making the unguentum populeum.

POPULUS ALBA, *the white Poplar tree*, has a root that ſpreads on the ſurface of the earth, and the trunk is high, and full of branches, with a ſmooth, whitiſh bark. The wood is white, but not ſo hard as that of the black poplar, and is more eaſily cloven. The leaves are broad, and deeply cut on the edges, they being not very unlike thoſe of the vine, or the large maple, but they are more ſmall, green, ſmooth, and without hair above, but underneath they are white, and downy, and have long pedicles. The catkins and fruit grow on different trees, and are like thoſe of the former. It delights in moiſt places, and grows to a conſiderable height in a little time. It may be eaſily propagated by the ſhoots that grow on the foot of the tree, and may be planted in meadows, but not in the places where the ſpreading roots will damage the graſs. It grows almoſt every where, and the wood is of greater uſe than that of the black. In France they make wooden ſhoes with it, and it ſerves every where for the heels of women's ſhoes. No part of it is now uſed in medicine.

PORRUM COMMUNE CAPITATUM, *the common Leek*, has an oblong, almoſt cylindrical, ſmooth, ſhining, white, bulbous root, conſiſting of ſeveral white coats, joined one to another, and furniſhed below with ſeveral fibres. The leaves proceed from the coats of the root, to the height of a foot, and are pretty broad, and placed alternately; they are flat or folded in the form of a gutter, and are of a pale greeniſh colour. Between theſe leaves there riſes a ſtalk to a conſiderable height, and in ſome countries it is five feet high, and as thick as a man's finger. It is firm, ſolid, full of juice, and has at the top a bunch of flowers, each of which conſiſts of ſix petals, compoſed in the ſhape of a bell, with as many large cylindrical ſtamina, terminating in three capillaments, of which the middlemoſt is furniſhed with a chive. The piſtil is ſeated in the center of the flower, which becomes a roundiſh fruit, divided into three cells, containing roundiſh ſeeds. It has ſomewhat of the ſmell of an onion, and is a common kitchen plant, uſed almoſt every where. It flowers in July, and its ſeed is ripe in Auguſt. It is ſomewhat hard of digeſtion, and is a little windy; but theſe inconveniences may be avoided by boiling them well. They are diuretic, and a drachm of the ſeeds in particular may be given in a glaſs of white wine for that purpoſe. It is cultivated by ſowing the ſeeds in the ſpring, along with thoſe of onions; and when theſe laſt are drawn up in July, the leeks will have time to grow large afterwards.

PORTULACA, *Purſlane*, has generally a ſingle root with a few fibres, which becomes woody in length of time; the ſtalks grow to the height of a foot, and are thick, roundiſh, reddiſh, tender, full of juice, ſmooth, and divided into ſeveral branches; the leaves, which are ranged alternately, are almoſt round, thick, fleſhy, ſhining, of a yellowiſh colour, and a clammy taſte. The flowers grow at the places where the leaves join to the ſtalks, and are of a yellow or pale colour. They are each compoſed of five leaves, which expand in the form of a roſe. The calyx conſiſts of a ſingle leaf, ſomewhat like a mitre, from which riſes a piſtil, which, together with the flower-cup, turns to a fruit, or oblong capſula, that is, like a ſmall urn, and of an herbaceous colour. Theſe capſula open tranſverſely into two parts, and contain many ſmall black ſeeds. It is propagated almoſt every where in gardens, by ſeeds, which muſt be ſown in beds of light rich earth, during any of the ſummer months, and it will be fit for uſe ſix months after ſowing. It is cooling, abates the acrimony of the humours, and is excellent in the ſcurvy. It is only proper for young perſons, and thoſe of a hot, bilious conſtitution. The leaves of purſlane being chewed, abate the pains of the teeth, that ariſe from having been ſet on edge by eating green fruit.

PRIMULA VERIS, *Primroſe*, has a thick, ſcaly, reddiſh, fibrous root, that ſends forth large, rough, wrinkled leaves in the ſpring of the year, which lie on the ground, and are covered with ſo ſhort a down, that it can hardly be perceived. From among theſe leaves there ariſe ſeveral ſtalks, to the height of a palm, that are round, a little hairy, naked, firm, and ſuſtain the bunches of flowers at the top; they conſiſt of a ſingle petal, the lower part of which is tubulous, but the upper part expands in the form of a ſalver, and is cut into ſeveral ſegments. The piſtil ariſes from the flower-cup, which is fiſtulous, and, when the flower is decayed, turns to an oblong fruit or huſk, lying almoſt concealed in the flower-cup; it opens on the top, and diſcovers many roundiſh ſeeds, faſtened to the placenta. It grows almoſt every where in the fields, in ſhady places, from whence they may be tranſplanted into the garden, and placed under hedges. The beſt time for this is about Michaelmas, and then the roots will produce flowers early in the ſpring. It has always been obſerved, that this plant has ſomewhat of a ſoporiferous quality. The medicinal uſes of this flower are not yet properly aſcertained.

PRUNUS, *the Plumb tree*, has a flower that conſiſts of five petals, placed in a circular order, and expanded in the form of a roſe. The piſtil ariſes from the flower-cup, which afterwards becomes an oval, globular fruit, with a ſoft fleſhy pulp, ſurrounding an hard oblong ſtone, generally pointed. The pedicles, or foot ſtalks, are long and ſlender, and there is only a ſingle plumb on each. There are ſeveral ſorts of plumb trees, as the *Jean hautve*, or white Primordian, which bears a ſmall, longiſh, white plumb, of a clear yellow colour, covered over with a white flue, that eaſily wipes off. The juice is ſweet, and it ripens in the middle of July.

The *early black Damaſk, commonly called the Morocco* PLUMB, is pretty large, of a round ſhape, and furrowed in the middle like a peach; the outſide is of a dark black, covered with a light violet bloom; the fleſh is yellow, and it parts readily from the ſtone.

It

It ripens towards the end of July, and is in good eſteem.

The *little black damaſk* PLUMB is ſmall and black, with a violet bloom, and the juice has a rich ſweetiſh taſte; the fleſh parts readily from the ſtone; it is a good bearer, and is ripe towards the latter end of *July*.

The *great damaſk violet* PLUMB *of Tours* is pretty large, inclining to an oval ſhape, and the outſide is of a dark blue, covered with a violet bloom; the juice is rich and ſweet, the fleſh yellow, and parts readily from the ſtone; it ripens towards the latter end of July.

The *Orleans* PLUMB is of a reddiſh black colour, and is a fruit ſo well known to almoſt every perſon, that it needs not be deſcribed; it is a very plentiful bearer, and is planted by thoſe who ſupply the markets with fruit, though it is but an indifferent plumb.

The *Fotheringham* PLUMB is of a blackiſh red, is ſomewhat long, and deeply furrowed in the middle; it has a firm fleſh, that readily parts from the ſtone; the juice is very rich, and it ripens towards the latter end of July.

The *Perdrigon* PLUMB is of a middle ſize, and an oval ſhape, with a very dark outſide, covered over with a violet bloom. The fleſh is firm, and full of an excellent rich juice; it is in great eſteem, and is ripe in the beginning of Auguſt.

The *violet Perdrigon* PLUMB is a large fruit, and rather round than long; it is of a bluiſh colour on the outſide, but the fleſh is yellowiſh, pretty firm, and adheres cloſely to the ſtone; the juice is extremely rich, and it ripens in the beginning of Auguſt.

The *white Perdrigon* PLUMB is of a middle ſize, and an oblong ſhape, with a yellowiſh outſide, covered with a white bloom. The fleſh is firm and well taſted, and it is a very good fruit, either to eat raw, or make into a ſweet-meat; for it has a pleaſant ſweetneſs, mixed with an acidity.

The *red imperial* PLUMB has a large fruit of an oval ſhape, and of a deep red colour, covered with a fine bloom. The fleſh is very dry, but it makes excellent ſweet-meats, and is ripe in the beginning of Auguſt.

The *white imperial Bonum magnum, or white Holland, or Mogul* PLUMB, is a large fruit, of an oval ſhape, and a yellowiſh colour, powdered over with a white bloom. The fleſh is firm, and adheres cloſe to the ſtone; the taſte is acid or ſour, which renders it unfit to be eaten raw; but it does very well baked, or to make ſweet-meats thereof. It is ripe in the beginning of September.

The *Cheſton* PLUMB is of a middle ſize, and of an oval ſhape, with a dark blue outſide, and a violet bloom. The juice is rich, and it is ripe in the beginning of Auguſt.

The *Apricot* PLUMB is a large round fruit, of a yellow colour, powdered over with a white bloom; the fleſh is dry, the taſte ſweet, and it parts readily from the ſtone. It ripens in the beginning of Auguſt.

The *Maitre Claud*, though it has a French name, is not ſo called in France; it is of a middle ſize, rather long than round, and the colour is finely variegated with red and yellow; the fleſh is firm, has a delicate flavour, and parts readily from the ſtone; it is ripe in the beginning of Auguſt.

The *red diaper* PLUMB is a large round fruit, of a reddiſh colour, powdered over with a violet blue; the fleſh has a very high flavour, and adheres cloſely to the ſtone, it is ripe about the middle of Auguſt.

St. Catherine's PLUMB is large and oval, but ſomewhat flat, and the outſide is of an amber colour, powdered over with a whitiſh bloom; but the fleſh is of a bright yellow, and is dry, firm, and adheres cloſely to the ſtone. It has a very agreeable ſweet taſte, and makes an excellent ſweet-meat; it is ripe in the beginning of September.

The *royal* PLUMB is a large fruit, of an oval ſhape, inclining to a point next the ſtalk; the colour is of a light red, powdered over with a whitiſh bloom, and the fleſh, which has a fine ſweet taſte, adheres to the ſtone; it is ripe about the beginning of September.

The *Brignole* PLUMB is of a large oval ſhape, and of a yellowiſh colour, mixed with red; the fleſh is of a bright yellow, and, though it is dry, has an excellent rich flavour. It ripens towards the latter end of Auguſt, and is thought to be the beſt plumb for ſweet-meats yet known.

The *black Bullace* grows wild in the hedges all over England, and is ſeldom or never cultivated in gardens.

The *white Bullace* grows wild as the former, and is very rarely planted in gardens.

The *Black-thorn*, or *Sloe-tree*, is very common almoſt every where, and is chiefly uſed for planting hedges, like the white thorn, and its being of a quick growth renders it very proper for that purpoſe. All ſorts of plumbs are propagated by budding or grafting on the ſtocks of any ſort that ſhoot freely; however, budding is much preferable to grafting.

PLUMBS are in great eſteem every where, and may be planted to grow in various manners, as in ſtandards, eſpaliers, or againſt walls. They require a ſoil neither too dry nor too wet, and thoſe that are planted againſt walls ſhould be placed to an eaſt or ſouth-eaſt aſpect, which are better than a direct ſouth. Plumbs in general are moiſtening, laxative, and emollient, except the bullaces and ſloes, which are aſtringent. They are cooling, quench thirſt, and create an appetite, and therefore they agree beſt with hot conſtitutions; but they do not at all ſit eaſy with thoſe that have weak ſtomachs. In thoſe years that plumbs are very plenty, and conſequently much eaten by all ſorts of people, fluxes of the belly generally abound, which often turn to bloody fluxes; hence it appears, that they ought always to be eaten very moderately, and then they ſhould be quite ripe and ſound.

PULEGIUM, *Penny-royal*, has a creeping, fibrous root, with ſquare hairy ſtalks, ſome of which are upright, and others creep upon the ground. The leaves are like thoſe of marjoram, but ſofter to the touch, and blacker; the ſmell is agreeable, but ſtrong, and the taſte is hot. The flowers proceed from the places where the leaves join to the ſtalks, and are diſpoſed in rings round them; they are of a bluiſh or purple colour, though ſometimes of a pale red; they are labiated, and the upper lip is cut into two ſegments; theſe are ſucceeded by ſmall ſeeds. It flowers in July and Auguſt, at which time it ought to be gathered for uſe. This plant is aperient, hyſteric, and good for diſorders of the ſtomach and breaſt. It is proper for inveterate coughs, and rheums, and ſome recommend it to cure hooping-coughs. It may be taken in the manner of tea.

PULMONARIA, *Lungwort, or Sage of Jeruſalem*, has a white fibrous root, and angular, hairy ſtalks, which riſe to a foot in height, and are of a purpliſh colour, reſembling thoſe of bugloſs. Some of the leaves proceed from the root, and lie upon the ground, while others embrace the ſtalks without pedicles; they are all oblong, broad, terminate in a point, have a nerve that runs through the whole length, are covered with a ſoft down, and generally marbled with whitiſh ſpots. The flowers grow in bunches, and each conſiſt of tubes, that terminate in the ſhape of baſons on the upper part; they are cut into five ſegments, and are of a purple or violet colour, with a calyx that is a dentated tube. They are

are ſucceeded by four roundiſh ſeeds, contained in the flower-cup like thoſe of bugloſs. It grows in woods, groves, and in mountainous and ſhady places, It is alſo cultivated in gardens, and flowers in March and April.

PULMONARIA ANGUSTIFOLIA, *Lungwort, or narrow leaved Sage of Bethlehem*, has a root like the former, which ſends forth angular hairy ſtalks, to the height of a foot, and the leaves are oblong, narrow, and hairy, like thoſe of wild bugloſs, but ſofter, and not ſo rough; they have no pedicles, and they embrace their ſtalk by the middle. The flowers grow on the top of the ſtalks, and are like the former, only they are of a fine purple colour, mixed with blue. It grows almoſt every where, in woods and ſhady mountainous places.

PULMONARIA GALLORUM, *French Lungwort*, has a long, thick, jointed, reddiſh, fibrous root, full of a bitter milky juice, and the ſtalks riſe to the height of a foot and a half; theſe are ſlender, hairy, and divided into ſeveral branches. The leaves proceed from the root, lie on the ground, and are ſinuated towards the pedicle, they are greeniſh and hairy above, downy and whitiſh below; but generally marbled with long blackiſh ſpots. The flowers grow on the tops of the branches, and conſiſt of yellow ſemi-florets, placed in a ſcaly cup; they are ſucceeded by oblong, ſmall, tufted ſeeds, of a blackiſh colour. It generally grows on old walls, and in uncultivated places; it flowers in June and July, and ſometimes later. They have all three the ſame virtues, and are accounted good in diſeaſes of the lungs.

PULSATILLA, *Paſque-flower*, has a long, thickiſh, ſingle root, which is divided into ſeveral heads, that are hairy on the upper part and black. The leaves proceed from the root, and are jagged and hairy; they are placed on long, reddiſh, very hairy ribs, that lie near the ground. From between the leaves there proceeds a round hollow ſtalk, to the height of a foot, covered with a thick ſoft down, and is without leaves, except one a little below the top. The flower conſiſts of ſix oblong, pointed petals, diſpoſed in the form of a roſe, of a purple colour, hairy without, and ſmooth within. The piſtil is placed in the middle, ſurrounded with yellow ſtamina or chives; this turns to a fruit, with a round head, that conſiſts of ſeveral ſeeds, that terminate in a tuft like a feather. It grows in ſtony, dry, mountainous places, flowers near Eaſter, and is called Paſque by the French, from whence it has its name. It is cultivated in gardens, for the ſake of the flowers. It is ſaid to be a vulnerary plant, and the powder of the dried leaves and flowers, ſnuffed up the noſe, provoke ſneezing; but it leaves a burning heat behind it, that reaches as far as the brain; for this reaſon it is accounted good in ſleepy diſeaſes.

PYROLA, *Winter-green*, has a flexible, ſlender, fibrous, creeping, whitiſh root, which ſends forth five or ſix fibrous leaves, like thoſe of the pear tree; they are fleſhy, thick, of a deep browniſh green, and are ſmooth, have long pedicles lying on the ground, and continue green all the winter. The ſtalk riſes to the height of a foot among the leaves, and is angular, ſingle, and ſometimes furniſhed with ſmall pointed leaves; the flowers grow on the top, and are beautiful, ſcented, and are compoſed of five petals, placed in the form of a roſe; they are white, and have ten ſhortiſh ſtamina, with a crooked piſtil in the middle, like the trunk of an elephant; this turns to an angular fruit or button, conſiſting of five furrowed cells, containing reddiſh ſeeds, that are exceeding ſmall. It grows wild in the north of England, on moſſy moors, hills, and heaths; for which reaſon it is difficult to cultivate them in the ſouthern parts; it flowers in June and July, and is looked upon to be an aſtringent vulnerary plant, and proper to ſtop internal bleedings; it may be taken in the manner of tea.

PYRUS, *the Pear tree*, has flowers that conſiſt of ſeveral leaves, placed in a circle, which expand in the form of a roſe; the flower-cup becomes a fleſhy fruit, univerſally known, that has a hollow like a navel on the upper part; the cells, in which the ſeeds are lodged, are ſeparated by ſoft membranes. The tree is ſo well known, that it needs no deſcription, and therefore it will be ſufficient to deſcribe the ſeveral ſorts of fruit.

The *little muſk* PEAR, *commonly called the ſupreme*, is generally produced in large cluſters, and is rather round than long, with ſhort ſtalks; the ſkin is yellow when ripe, and the juice is ſomewhat muſty; it is an excellent pear, if gathered before it is too ripe. It ripens towards the middle of July, and will continue good but a few days.

The *Chio* PEAR, commonly called *the little Baſtard muſk pear*, is ſmaller than the former, but much of the ſame ſhape. The ſkin, when ripe, has a few ſtreaks of red on the ſide next the ſun, but it ſeldom hangs in cluſters.

The *haſting* PEAR, *commonly called the green Chiſſel*, is larger than either of the former, and is longer next the ſtalk. The ſkin is thin, and of a whitiſh green when ripe; the fleſh melts in the mouth, and, if not too ripe, has a ſweetiſh taſte; it is fit to gather towards the end of July.

The *red* MUSCADELLE is a large early pear, of great beauty, and the ſkin is of a fine yellow, beautifully ſtriped; the fleſh has a rich taſte, if gathered before it be too ripe; but it is apt to be mealy. The tree generally produces two crops in a year, the firſt of which is commonly ripe towards the end of July, and the ſecond in September, but is ſeldom well taſted.

The *little* MUSCAT is a ſmall pear, rather round than long, and the ſkin is very thin, and of a yellowiſh colour when ripe. The fleſh melts in the mouth, and has a rich muſky flavour; but will not keep long when ripe, which is towards the latter end of July.

The JARGONELLE is a very long pear, in the ſhape of a pyramid, with a long pedicle or ſtalk; the ſkin is pretty thick, and of a ruſty colour towards the ſun; but the other ſide is of a ruſſet green; the fleſh has a rich muſky flavour, and it ripens towards the end of July. This is one of the beſt early ſummer pears.

The *Windſor* PEAR is of an oblong ſhape, and terminates almoſt in a point next the ſtalk; the ſkin is ſmooth, and when ripe, of a yellowiſh green, with a very ſoft fleſh; but if it hangs two or three days after it is ripe, it grows mealy.

The JARGONELLE, now commonly called *Cuiſſe madame*, is ſomewhat like the *Windſor Pear*, but is longer towards the crown, and ſmaller next the ſtalk; the ſkin is ſmooth, and of a pale green, with a fleſh that is apt to be mealy.

The *orange muſk* PEAR is of a middle ſize, of a ſhort roundiſh form, and a yellowiſh ſkin, ſpotted with black. The fleſh is muſky, but is apt to be a little dry and choaky; it is ripe in the beginning of Auguſt.

The *little blanket* PEAR is much leſs than the former, and more pinched in near the ſtalk, which is ſhorter, but ſlenderer than that of the former. The ſkin is ſoft, and of a pale green, with a tender fleſh, full of a rich muſky juice; it ripens in the beginning of Auguſt.

The *long ſtalked blanket* PEAR is ſhaped ſomewhat like the former, but the eye is larger, and more hollow at the crown; it is ſomewhat plumper towards the ſtalk, and a little crooked, with a very ſmooth white ſkin; the fleſh is full of a rich ſweetiſh juice, and it is ripe about the middle of Auguſt.

The *ſkinleſs* PEAR, or *early Ruſſelet*, is middle-ſized, long, and of a reddiſh colour, with an extremely thin ſkin; the fleſh melts in the mouth, and is full of a rich, ſweet juice; it ripens in the beginning of Auguſt.

The *muſk robine* PEAR, *the queen's* PEAR, or *the amber* PEAR, is ſmall and round, and of a yellowiſh colour when ripe; the fleſh has a rich muſky flavour, and it ripens in the beginning of Auguſt.

The *muſk drone* PEAR is middle ſized and round, and the ſkin is of a yellowiſh colour when ripe. The fleſh melts in the mouth, and is full of a muſky juice; but, if it hangs too long on the tree, it grows mealy: it ripens in the beginning of Auguſt.

The *red orange* PEAR is middle ſized and round, and of a greeniſh colour, except on the ſide next the ſun, which is purple when ripe. The fleſh melts in the mouth, and the juice is ſweet, with a very hollow eye, and a ſhort ſtalk; it ripens about the middle of Auguſt.

The *great onion*, PEAR, *or the Summer Arch-duke*, is of a middle ſize and round, and of a browniſh purple next the ſun; the fleſh melts in the mouth, and is tolerable good; it ripens in the beginning of Auguſt.

The *Auguſt* MUSCAT, *or the royal* PEAR, is in ſhape much like a Bergamot, and the ſtalk is long, ſtrait, and a little ſpotted. The ſkin is ſmooth, and of a whitiſh yellow colour, with a rich, ſweet, perfumed juice; it is one of the beſt ſummer pears yet known, and grows ripe in Auguſt.

The *roſe* PEAR is ſhort and round, and of a yellowiſh green colour, but a little inclining to red next the ſun. The ſtalk is very long and ſlender, and the juice is muſky; it grows ripe in Auguſt.

The *prince's* PEAR is ſmall, roundiſh, and of a bright red colour next the ſun, but on the other ſide it is yellowiſh; the fleſh has a very high flavour, and grows ripe in the middle of September.

The *great mouth-water* PEAR is large and round, with a ſmooth green ſkin, and a ſhort thick ſtalk; the fleſh melts in the mouth, and is full of juice, if gathered before it is too ripe, which is about the middle of Auguſt.

The *ſummer Bergamot* is a pretty large, round, flat pear, of a greeniſh yellow colour, and hollowed a little at both ends, like an apple; the fleſh melts in the mouth, and it is ripe towards the latter end of Auguſt.

The *autumnal Bergamot* is ſmaller than the former, but of the ſame ſhape, with a yellowiſh green ſkin, reddiſh on the ſide next the ſun; the fleſh melts in the mouth, and it grows ripe towards the latter end of September.

The *Swiſs Bergamot* is ſomewhat rounder than the former, with a tough greeniſh ſkin ſtriped with red; the fleſh is full of juice, melts in the mouth, and it is ripe in the beginning of October.

The *red butter* PEAR is ſometimes of other colours, as green or grey, whence ſome have ſuppoſed them to be different fruits. It is large and long, and generally brown, with a melting fleſh, full of rich ſweet juice; it ripens in the beginning of October.

The *long green* PEAR is long, and very green when ripe, with a melting juicy fleſh. It grows ripe in the middle of October, and in ſome years will keep till December.

The *white and grey Meſſieure Jean* is one of the beſt autumnal pears, when grafted on a free ſtock. It is a large roundiſh fruit, with a tough ſkin, that is generally brown; it is full of a rich ſweet juice, and ripens about the beginning of October.

The *flowered Muſcat* is an excellent pear, of a middle ſize, and round, with a dark red ſkin; the fleſh is very tender, and of a delicate flavour; it ripens towards the end of October.

The *vine* PEAR is round, and of a middle ſize, with a dark red ſkin; the fleſh is full of a clammy juice, and it grows ripe towards the end of October; but ſhould be gathered before, otherwiſe it will ſoon rot.

The *Rouſſiline* PEAR has a ſmooth ſkin, of a deep red colour next the ſun, with grey ſpots, but the other ſide is of a greeniſh-yellow; the fleſh is tender and delicate, and the juice ſweet; it is ripe towards the end of October, but muſt not be kept long.

The *Marquiſe* PEAR is like the Blanket, when planted in a dry ſoil; but, when it is rich and moiſt, it grows larger. It is flat at the top, with a ſmall hollow eye, and a ſkin of a greeniſh yellow, inclining to red on the ſide next the ſun. If it is yellow when ripe, the fleſh is tender and delicate, and full of a ſweet juice. It grows ripe at the beginning of November.

The *craſſane, or flat butter* PEAR, is of a middle ſize, and hollowed at the crown like an apple. The ſtalk is very long and crooked, and the ſkin is rough, and of a greeniſh colour when ripe, or rather ruſſet. The fleſh is tender and buttery, with a rich ſweet juice. It is the very beſt pear of the ſeaſon, and is fit to eat about the middle of November.

The *Lanſac*, or *Dauphine* PEAR, is about the ſize of a Bergamot, of a roundiſh ſhape, and flat towards the head; but it is a little longiſh towards the ſtalk; the ſkin is ſmooth, of a yellowiſh-green, with a yellow, tender, ſweet fleſh; the eye is very large, and the ſtalk long and ſtrait; it grows ripe about the middle of November.

The *Martin ſec* is like the ruſſelet in ſhape and colour. The ſhape is oblong, and the ſkin is of a deep ruſſet on one ſide, but on the other inclining to red. The fleſh is fine and ſweet, and it is fit to eat about the latter end of November.

The *little lard* PEAR, *or the ruſſet of Anjou*, is of a bright green, with a few ſpots, and a large hollow eye. The fleſh is extremely fine, with a ſweet juice; it is fit to eat in December, and is one of the beſt fruits in that ſeaſon.

The *Louiſe bonne* has a ſhort fleſhy ſtalk, a ſmall eye and flower, and a very ſmooth ſkin; the colour is green, inclining to white, and the fleſh is extremely tender, and full of a ſweet juice. It is fit to eat in December.

The *Eſchaſſorie, or the winter long green* PEAR, is ſhaped like a citron, with a ſmooth green ſkin, that becomes yellowiſh when ripe. The eye is ſmall, and the fleſh melting and buttery, with a ſweet juice. It is fit to eat in the beginning of December.

Parkinſon's Warden, or the black Pear of Worceſter, commonly weighs a pound or upwards, and has a rough, dark, red ſkin next the ſun. It is only fit for baking or ſtewing, and is in ſeaſon from November to Chriſtmas.

The *ſmall winter butter* PEAR has a ſmall oblong ſhape, and a yellow colour, ſpotted with red. The fleſh has a very rich juice, and it is fit to eat in December and January.

The *Ronville* PEAR is about the ſize and ſhape of a large ruſſelet, and the middle is ſwelled more on one ſide than the other; the ſkin is ſoft and ſmooth, and of a lively red colour next the ſun, but yellow on the other; the fleſh is full of a very ſweet juice, that is a little perfumed.

The *winter citron* PEAR, *or the Muſk-orange*, is a pretty large pear, and is in ſhape and colour very like an orange; the fleſh is hard and dry, and apt to be ſtony, but it bakes very well, and is in ſeaſon from December to March.

The *winter ruſſelet* PEAR is of a greeniſh-yellow, inclining to brown, with a buttery melting fleſh, which is generally very full of a very ſweet juice; but

but it muſt always be pared, becauſe the ſkin has a bad taſte. It is fit to eat in January and February.

The *Bergamot Bugi* is a large pear, and almoſt round, but it is a little longiſh towards the ſtalk; the eye is flat, and the ſkin green, and there are many rough protuberances thereon; but as it ripens it becomes yellowiſh, and in a good ſeaſon the fleſh is ſweet; it is good to eat from February to April.

The *Dutch Bergamont* is large and round, and of the ſhape of the common bergamot; the colour is greeniſh, the fleſh pretty tender, and the juice of a high flavour. It continues good till April.

The *Naples* PEAR is pretty large, long, and greeniſh, with a ſweet, and ſomewhat veinous juice; it is called in England the *Eaſter St. Germain*, and will keep till April.

There are many other ſorts of pears that are ſtill to be ſeen in ſome old gardens, but are of no great eſteem; thoſe that plant pears for uſe, ought always to chooſe them of the beſt ſorts, becauſe the trouble and expence is the ſame. They are propagated by budding or grafting them upon ſtocks of their own kind, which are commonly called free ſtocks; but quince ſtocks are greatly uſed in the nurſeries, for all ſorts of pears that are deſigned for dwarfs or walls.

As to wild pears, they are always ſo aſtringent and rough, that they are not fit to be eaten, though they may ſerve well enough to make perry. In general, pears are windy, and improper for weak ſtomachs; ſome think they are enemies to the nervous parts; however, thoſe are beſt that are quite ripe, and have a ſweet juice, and then they are ſeldom noxious, unleſs eaten to exceſs.

QUERCUS VULGARIS, *the common oak tree*, is well known in all parts of Europe, as alſo its wood, for its long duration, and various uſes. The flowers are long catkins, which conſiſt of a great number of ſmall ſlender threads; but the embryoes are produced at ſome diſtance from theſe, and afterwards become acorns, with hard ſcaly cups. It grows in woods, foreſts, and high mountainous places; the leaves appear before the flower, and the catkins may be ſeen in April and May, but the acorns are not ripe till Auguſt. It is commonly ſaid, that an oak tree is an hundred years coming to its full growth, an hundred years in perfection, and an hundred years in decaying. Some affirm the wood will continue good ſix hundred years in the open air, and five hundred under ground. Oak bark is of very great uſe for tanning of leather, and upon theſe accounts the oak is called by ſome the king of trees. The Engliſh oak is beſt for building of ſhips; but now there are great numbers conſtructed in New-England, of the oak wood that grows in thoſe parts, though they are not ſo laſting.

The leaves of the oak are ſtyptick, and a little biteriſh, and all parts of it are aſtringent. They have often been preſcribed for all ſorts of hæmorrhages and fluxes of the belly, and ſome pretend that a decoction of the bark has cured a moſt terrible bloody-flux. In times of ſcarcity, a great many poor people have made bread of the acorns, and the poets tell us they were the food of the golden age; however, they are heavy, windy, and hard of digeſtion, and therefore mankind in thoſe early ages muſt doubtleſs have a better digeſtion than us. They are now given to hogs, for which they are excellent nouriſhment, and render the fleſh fat, firm, and ſweet; for which reaſon that bacon is in moſt eſteem, that comes from places where there are plenty of acorns.

There are a great number of trees that go under the name of oaks, in divers parts of the world, but there are no where ſo many different kinds, as in America; the wood however is not nigh ſo valuable as the Engliſh oak, which has been hinted at above.

QUINQUE FOLIUM, *Cinquefoil*, has a long fibrous root, blackiſh without, and reddiſh within, which ſends forth ſeveral ſtalks to the height of a foot and a half, which are round, flexible, hairy, reddiſh, and knotted; from theſe knots the leaves and roots proceed, and by their means this plant multiplies greatly. The leaves are oblong, roundiſh at the ends, nervous, hairy, dentated on the edges, of a dark green, and placed like an open hand, to the number of five upon the ſame pedicle, which is three inches and upwards in length. The flowers grow ſingle on the top of the ſtalks, and conſiſt of five yellow petals, in the form of a roſe, and are ſomewhat in the ſhape of a heart; there are five ſtamina, with their apices in the form of a half-moon, and the piſtil becomes a round fruit, compoſed of many pointed ſeeds, placed in the form of a head, and contained in the cup of the flower. It grows in fields, and in ſandy ſtony places, as well as in meadows on the ſides of waters; it flowers in May and June, and the root is chiefly in uſe. It is accounted balſamic, vulnerary, and aſtringent, and has been given in all ſorts of hæmorrhages, as well as in all kinds of fluxes of the belly; ſome affirm it ſucceeds better than ipecacuanha; for which purpoſe an ounce of the root has been boiled in three pints of water to two; this decoction is alſo recommended in ſpitting of blood. It is confidently ſaid, that a drachm of this root, given in a glaſs of water, before a fit of an ague, will certainly cure it.

RANUNCULUS BULBOSUS, *Bulbous Crow-foot*, has a round bulbous root, with ſeveral upright ſtalks, that ſometimes riſe to the height of a foot, which are hairy, and have leaves that are cut into ſeveral ſlender jags, and on the top there are flowers of a fine yellow ſhining colour; they are generally ſingle, and conſiſt of five roundiſh petals, diſpoſed in the form of a roſe, the leaves of the calyx being bent back towards the pedicle. The fruit that ſucceeds the flower contains many roundiſh ſeeds, placed together in the form of a head. It flowers in May, and is to be met with almoſt every where in paſture grounds and meadows. When it is tranſplanted into gardens, the flower becomes double. The root of crow-foot is extremely acrid and cauſtic, and ſome authors recommend it to raiſe bliſters; but this practice is dangerous, becauſe it may cauſe a gangrene. There are quacks that apply it to the part afflicted with the gout, and on corns, to take them away; but we have much ſafer remedies. In ſome places it is common for beggars to make ſores with this root, to raiſe compaſſion. The bruiſed leaves were once applied to the head of a patient, who had kept his bed for three years, on account of a violent head-ach, and they raiſed a bliſter, which ran freely, and he was ſoon cured.

RANUNCULUS NEMOROSUS, *Wood Anemone*, has a long creeping root, purpliſh or brown without, and yellowiſh within, when young. The ſtalk is ſmall, ſlender, reddiſh, and riſes to the height of a palm and a half, on the top of which there are three leaves, or reddiſh pedicles, each of which are cut down to the pedicle into three jags, and on the top there is a ſingle flower without a calyx, ſometimes white, and ſometimes purpliſh or fleſh coloured; it conſiſts of ſix oblong leaves, in the middle of which there are ſeveral yellowiſh ſtamina. Theſe are ſucceeded by naked, oblong, hairy ſeeds, collected into a head. It flowers towards the beginning of March, to the end of April. Some recommend a cataplaſm of the leaves and flowers for ſcald heads, and affirm it will cure them in a few days, if it be renewed twice a day; but others think it unſafe, from the bad effects they have ſeen from ſuch applications.

RANUNCULUS PRATENSIS REPENS, *Crow-foot*, has a ſmall creeping root, compoſed of whitiſh fibres, and many ſlender, round, hairy, hollow, creeping

creeping ſtalks, that lie upon the ground. The leaves are cut into three ſegments, ſomewhat like parſley, and are dentated on the edges, and hairy on both ſides; they are of a blackiſh green, and generally marked with fine ſpots on the upper part. The flowers are of a ſhining yellow, and compoſed of five petals, diſpoſed in the form of a roſe, with a great number of ſtamina in the middle, and a flower-cup, conſiſting of five leaves, that falls off with the flower, which are ſucceeded by black ſeeds, placed together in the form of a head, and full of ſmall points or prickles. It flowers in May, and grows almoſt every where in meadows and ſhady places. This may be taken inwardly without danger, and the cattle that feed on it yield a great deal of milk. Some uſe it in a fomentation againſt the piles. There are other ſpecies of the crow-foot, which had beſt be avoided.

RAPA, *the Turnep plant*, has a tuberoſe, fleſhy, bellied, round, thick root, that grows ſometimes to the ſize of a child's head, and is univerſally known. The leaves are oblong, large, lie upon the ground, and are cut deeply into jags. They are rough to the touch, are of a greeniſh brown colour, and of the taſte of a pot herb. The ſtalk riſes from among the leaves, to the height of two feet, and ſometimes to that of a man. The leaves embrace the ſtalk with their broad baſe, and terminate in a point. The flowers grow on the top of the ſtalk, are yellow, and conſiſt of four leaves, diſpoſed in the form of a croſs, with a calyx fixed on a long ſlender pedicle. The piſtil is ſucceeded by a pod, divided into two cells, by a partition, which contain two rows of roundiſh, reddiſh ſeeds. It flowers in the ſpring and ſummer.

RAPA OBLONGA, *ſive* FŒMINA, *oblong*, or *female Turnep*, differs from the former in having an oblong root that is not ſo thick. Beſides theſe, there are the garden turnep, with a green root above ground; the ground garden turnep with a purple root; the round garden turnep with a black root, and the round garden turnep with a yellow root both within and without; they all delight in a light ſandy ſoil, for in a rich ſoil they will grow rank and ſticky. The common ſeaſon for ſowing them is from the middle of June to the latter end of Auguſt, and in ſome places they ſow them much later.

The uſe of turneps, as an aliment, is well known, and they are accounted an emollient, and proper to abate the acrimony of the humours; but they are windy, cauſe obſtructions, and do not digeſt very eaſily. They are accounted a great pectoral, and many have been ſaid to be cured of an aſthma by their juice, that is, by taking a large ſpoonful in a morning faſting, for forty days together.

RAPHANUS MINOR, *the garden Radiſh*, has a long fleſhy root, red or purple without, and white within. The leaves are large, rough, green, deeply cut, and much like thoſe of turneps. A ſtalk ariſes from among theſe, to the height of a foot and a half, or two feet, that is round, branched, and is adorned with flowers, conſiſting of four petals, in the form of a croſs; the piſtil ariſes from the flower-cup, which turns into a pod of the ſhape of a horn, that is ſpongy within, and contains two rows of roundiſh ſeeds that are ſeparated by a thin membrane. It is cultivated in gardens, and the root is chiefly in uſe in the ſpring, which is tender, full of juice, and eaten as food. It agrees very well with moſt conſtitutions, provided they have good ſtomachs, for it is apt to riſe therein. The juice is good in the gravel, if four ounces be taken of it for four days, in a morning faſting.

RAPHANUS RUSTICANUS, *Horſe Radiſh*, has a long, thick, creeping, white root, that ſends forth large long pointed leaves, of a fine green colour, ſomewhat like monk's rhubarb. From among theſe there ariſes a ſtalk, to the height of a foot and a half, which is upright, hollow, furrowed, and furniſhed with leaves, a palm in length, and an inch in breadth, and cut deeply on both ſides. On the top there are ſmall flowers, compoſed of four white petals, in the form of a croſs, which are ſucceeded by ſmall roundiſh pods, divided into two cells, that contain ſmooth, roundiſh, reddiſh ſeeds. It flowers in the ſpring, and grows wild on the ſides of brooks and rivers, but is cultivated in gardens. It is uſed as muſtard, to promote the digeſtion of aliments, and to create an appetite. The diſtilled water is given to four ounces againſt the ſcurvy and gravel, and to cleanſe the blood. The expreſſed juice of the roots and ſeeds mixed with honey, and taken in a morning faſting, for ſome time, in whey, cleanſes the ſtomach, kidneys, and lungs; it cures coughs, and inveterate hoarſeneſſes, provided they are not dry, or attended with ſpitting of blood. It is ſaid to be excellent againſt the ſcurvy, dropſy, and rheumatiſm, if continued for ſome time. The doſe of the root in powder, is from one ſcruple to two; of the freſh root in decoction, from half an ounce to an ounce; and of the juice a ſpoonful. It is hard to ſay what a ſcruple of the root will do, ſince it is often eaten at meals in much larger quantities, therefore this ſeems to be a trifling doſe.

RESEDA VULGARIS, *common baſtard Rocket*, has a long, ſlender, woody, white root, which ſends forth ſeveral ſtalks, to the height of a foot and a half, that are furrowed, hollow, hairy, branched, weak, crooked, and furniſhed with leaves, placed alternately; theſe are deeply cut, are curled, and of a dark green colour, with the taſte of a pot-herb. The flowers are in looſe ſpikes, and are each compoſed of yellow irregular petals, in the middle of which there are ſeveral ſmall ſtamina, with yellow apices, and a piſtil that turns to a four-cornered fruit, an inch in length, and like cylindric urns, full of ſmall, roundiſh, black ſeeds. It flowers in June, July, and Auguſt, and is common in the fields. There are ſeveral kinds of this plant, that are propagated in the gardens of curious botaniſts. It is ſaid to be emollient and reſolvent, and is applied externally by ſome, to diſcuſs inflammatory ſwellings, as well as to eaſe the pain.

RHAMNUS CATHARTICUS, *purging Buckthorn*, is a ſhrub with a long, hard, woody root, and it ſometimes grows to the height of a tree, with a bark, like that of the cherry tree, and a yellowiſh wood; the branches are armed with thorns, like thoſe of the wild pear tree. The leaves are roundiſh, of a blackiſh green, ſlightly dentated on the edges, and pretty much like thoſe of the plumb tree. The flowers are ſmall, of a greeniſh or yellowiſh colour, grow in bunches along the branches, and conſiſt of ſingle petals, in the ſhape of a funnel, divided at the top into four parts, and have as many ſtamina. Theſe are ſucceeded by ſoft berries, green at firſt, and black when they are ripe; they are as large as juniper berries, are ſhining, and full of a greeniſh black juice, with four ſeeds, roundiſh on the back. This ſhrub is common in hedges, and flowers in May, and the berries are ripe towards October. When theſe berries are gathered in harveſt time, and ſteeped in alum-water, they will yield a yellow or ſaffron coloured juice; if they are gathered in autumn, when they are ripe, and kept in a glaſs veſſel, they will yield a good green; but if they are left on the tree till towards St. Martin's day, they will yield a ſcarlet, that is very uſeful to dye leather, and to colour cards with red. It is well known that the berries are a purge, which are ſaid to be good in the dropſy, palſy, rheumatiſm, and gout. A drachm, or a drachm and a half, of the ripe berries, dried and powdered, is a doſe. They generally occaſion gripes,

gripes, ſickneſs, a dryneſs of the mouth and throat, and thirſt. About twenty of the freſh berries is a doſe in ſubſtance, and twice or thrice this number in decoction, or an ounce of the expreſſed juice. A ſyrup made of the juice is kept in the ſhops.

RHUS FOLIO ULMI, *common Sumach*, has a long, creeping, woody root, and is a ſhrub that grows ſometimes to the height of a tree; the leaves are oblong, pointed, hairy, winged, reddiſh, dentated on the edges. The flowers grow in bunches among the leaves of the branches, at the top, and are of a whitiſh yellow colour; they are compoſed of five leaves diſpoſed in the form of a roſe, ſuſtained by a calyx, and divided into five parts. The piſtil turns to a flat, oval, membranous, greeniſh capſula, that contains a ſingle ſeed, almoſt of the ſhape of a kidney. It grows plentifully in the ſouthern parts of Europe, as alſo in Turky, where the branches are uſed for tanning of leather. This is not ſo common in England, as thoſe brought from America, which are the *Virginian Sumach*, improperly called *the Stag's horn tree; New England Sumach, with looſe herbaceous panicles, and ſmooth branches, the Canada Sumach, with a longer leaf, ſmooth on each ſide, and the dwarf Virginian Sumach with narrow leaves.* The firſt of theſe is very common in gardens, and produces bunches of ſmall flowers in June, at the extremities of the branches, which are ſucceeded by ſeed included in red covers. They may be all propagated by ſeeds, which ſhould be ſown ſoon after they are ripe, and the plants will come up the following ſpring. The leaves and fruit have been ſometimes uſed in decoctions, for fluxes of the belly, and againſt internal hæmorrhages.

RIBES VULGARIS, *the red Currant buſh*, riſes to the height of two or three cubits, and has a bay or aſh coloured bark. The leaves are like thoſe of the vine, but much leſs, and are ſmooth, of a dark green above, but covered with a ſoft down beneath. The flowers grow in bunches, and are compoſed of five purple petals, placed in the form of a roſe, and are ſomewhat in the ſhape of a heart. The calyx is in the form of a baſon, divided into five ſegments, and the hinder part turns to a berry, green at firſt, and afterwards red, which is univerſally known. Beſides this, there are other ſorts, *as the Dutch red Currant, the common white, the large Dutch white, the Champaign, the Gooſeberry leaved, the ſmall wild, the black, and the yellow ſtriped leaved; the common Currant, with leaves, beautifully variegated with green and white; the white Currant with ſtriped leaves; the ſtriped gooſeberry leaved Currant; the black Currant with ſtriped leaves; and the American black Currant.* The manner of the flowering of this laſt is very different from the other ſorts; but the fruit is not much valued. They may be all propagated by cuttings, from September to March, but autumn is beſt, and they will thrive almoſt in any ſoil or ſituation. Red currants, and their preparations, are generally accounted good to abate internal heats, and to reſtrain the effervеſcence of the blood; as they are ſomewhat aſtringent, they ſtrengthen the ſtomach, excite an appetite, and are good againſt vomiting. Currants eaten too freely will cauſe looſeneſſes, attended with gripes, and are hurtful to the lungs.

The *leaves of black* CURRANTS have been accounted by ſome a ſort of a panacea, and in ſome parts of France, after they have been bruiſed in wine, and the juice preſſed out, it has been given to half a pint, twice a day, for eight days together, to thoſe that have been bitten by a mad dog, that is, in the morning faſting, and three or four hours after dinner. Others ſay, that four ounces of the juice of the leaves, or rather the infuſion in wine, for twenty-four hours, given to four ounces in a morning faſting, will cure the dropſy. In the Philoſophical Tranſactions it is ſaid, that the gelly of black currants, ſwallowed down leiſurely in ſmall quantities, is a ſpecific againſt the quinſey; and in winter, when the gelly cannot be had, a decoction of the leaves and bark in milk, uſed as a gargle, is ſaid to cure all inflammatory diſtempers of the throat.

ROSA PALLIDA, *ſive* INCARNATA, *the pale Roſe*, has a long, hard, woody root, that ſends forth ſeveral ſtalks, which form a ſhrub, that divides into firm long branches, covered with a dark greeniſh bark, and often furniſhed with ſtrong prickles; the leaves grow by pairs, and are generally ſeven in number, on one rib, which is terminated by a ſingle leaf; theſe are roundiſh, dentated on the edges, and rough to the touch. The flower is ſometimes ſingle, and compoſed of five large petals or leaves, with ſeveral yellow apices in the middle. It is ſometimes double, and then the external petals are a little larger than the internal, and of an agreeable red or carnation colour, with a very ſweet, though weak ſmell. When the flower is falling off, the calyx turns to an oval fruit, in the ſhape of a ſmall olive, with a rind that is a little fleſhy, and conſiſts only of a ſingle cell, full of angular, hairy, whitiſh ſeeds. It flowers in May and June, and is cultivated in gardens. The diſtilled water from theſe roſes is accounted good againſt inflammations of the eyes; and ſome ſay when it is given inwardly, from one ounce to ſix, it will ſtop looſeneſſes and ſpitting of blood; but the ſyrup of pale roſes is ſolutive, and is given from an ounce and a half to two ounces.

ROSA DAMASCENA PALLIDA, *the damaſk Roſe*, has a root like the former, from whence ariſe ſtalks or ſtems, to the height of ten or twelve feet, which are thick, ſtrait, and armed with reddiſh ſtrong thorns, that are not ſo flat as thoſe of the former; the leaves are alſo ſet at greater diſtances, are leſs wrinkled, more pointed, and are green above, and whitiſh below; they are dentated on the edges, and are ſometimes ſeven, and ſometimes nine on the ſame rib, placed by pairs oppoſite to each other, and terminating in a ſingle leaf; it has crooked thorns on the baſe. Some of theſe roſe buſhes have flowers, conſiſting only of five petals, that have a very ſweet ſmell. It is cultivated in gardens, and flowers in autumn. That with double flowers is not of a diſtinct kind, but only a variation of the former. The flowers are ſolutive, or rather purging; for two pugils infuſed in veal broth, and taken in a morning, will purge very well.

ROSA ALBA, *the white Roſe*, has a root like the former, which ſends forth ſtalks to the height of eight or ten feet, which are thick, woody, and armed with crooked pedicles. There are ſometimes five, and ſometimes ſeven, oblong, ſmooth, crenated leaves on one rib, that are ſometimes prickly at the baſe. The flowers which grow at the extremity of the branches are large, beautiful, and have a ſweet ſmell. It is cultivated in gardens, and generally flowers in May and June. All authors agree, that they are aſtringent, and the diſtilled water is made uſe of, in ſome parts, againſt inflammations of the eyes.

ROSA RUBRA, *the red Roſe*, has a creeping, ſtrong, woody root, with ſeveral ſtems, that are lower than thoſe of the former, covered with a green bark, armed with prickles. The flowers are of a beautiful red, with a ſweet agreeable ſmell; it is cultivated in gardens, where it flowers in June and July. Theſe are reckoned aſtringent, cleanſing, and proper to ſtrengthen the ſtomach, to ſtop vomiting, fluxes, and hæmorrhages. The doſe of the conſerve is from two drachms to half an ounce, and is given againſt coughs, and in conſumptions.

ROSA SYLVESTRIS VULGARIS, *the Dog-Roſe*, has a long, creeping, hard, woody root, that ſends forth long thick branches, armed with ſtrong thorns or prickles; the leaves are large, oblong, ſmooth,

ſmooth, and like thoſe of the common roſe. The flowers conſiſt of five white petals, with a mixture of red or carnation, and they fall off with the leaſt blaſt of wind; they are ſucceeded by oval oblong fruit, which are green at the beginning, and as red as coral when they are ripe. The rind is fleſhy, and has a ſweetiſh tart taſte; the ſeeds are angular, white, hard, and wrapped up in ſtrong hair, that readily ſeparates from them. It grows every where near or in hedges without cultivation. The fruit is called hips, and there is a conſerve made of them kept in the ſhops. Theſe flowers are purgative, like thoſe of other roſes; but the conſerve is recommended in fluxes of the belly, to moderate the heat of the bile, and to abate the ſharpneſs of urine; the doſe is from two drachms to half an ounce.

ROSMARINUS HORTENSIS ANGUSTIORE FOLIO, *narrow leaved garden Roſemary*, has a ſlender, ſmall, fibrous root, that ſends forth a ſtalk that becomes a ſhrub, which in ſome countries riſes to the height of three or four feet; the leaves are whole, narrow, hard, ſtiff, of a browniſh green above, and white below. The flower conſiſts of a ſingle petal, of a pale blue colour, that is labiated, and whoſe upper lip, or creſt, is cut into two parts, and is turned backwards, with crooked ſtamina or chives; but the upper lip or beard is divided into three parts, the middlemoſt of which is hollow like a ſpoon; the flower cup is dentated, being divided into three cells, from whence ariſes the piſtil, attended with four embryoes, that turn to as many roundiſh ſeeds, incloſed in the flower cup. It is cultivated in gardens, and flowers in April, May, and June; but it grows wild in many hot countries, ſuch as Spain, Italy, and the ſouthern parts of France. However, they are hardy enough to bear a moderate winter in theſe parts in the open air, provided they are planted on a poor, dry, gravelly ſoil. Beſides this, there is the *broad leaved garden Roſemary*; the *gold ſtriped Roſemary*; the *narrow leaved ſilver ſtriped Roſemary*; the *Roſemary of Almeria, with a large ſpiked purpliſh flower*, and the *broad leaved Roſemary with an elegant ſtriped leaf*. They may be all propagated by planting ſlips or cuttings at the beginning of the year, upon a bed of light freſh earth, and they ſhould be tranſplanted in the beginning of September, to the places where they are deſigned to grow.

The flowers and leaves are made uſe of in medicine, and are uſed both internally and externally. They ſtrengthen the brain, are good againſt the palſy and epilepſy, as well as obſtructions of the viſcera, they reſtore the tone of the ſolids, and incide and attenuate groſs humours. The water wherein the flowers and leaves are ſteeped for a night, is good for the jaundice, and it ſtrengthens the memory and ſight. Hungary-water is made from the flowers, cups, and young leaves of this plant, after they have been digeſted in ſpirits of wine, and the ſpirit diſtilled off; the doſe of this is a ſmall ſpoonful, in a glaſs of water. The conſerve of the flowers is cordial, ſtomachic, and cephalic, and the doſe is from a drachm to half an ounce. Boerhaave looks upon the eſſential oil, to be the beſt remedy againſt the epilepſy; and a few drops of it are to be given in wine; the uſual doſe of this is five or ſix drops.

ROS SOLIS, *Sun dew*, has a fibrous, ſlender, hairy root, that ſends forth ſeveral long, ſmall, hairy branches, on which there are ſmall roundiſh leaves that are hollow like an ear-picker, and of a pale green; the ſtalks are adorned with a reddiſh, hairy fringe, and are hollow, from whence tranſudes drops of a fluid into the hollow of the leaves, inſomuch that their hair is always moiſt, as it were with dew, in the drieſt ſeaſons. From among the leaves there ariſe two or three ſtalks, to the height of ſix inches, that are ſlender, round, reddiſh, tender, without leaves, and on whoſe top are ſmall whitiſh flowers, with ſeveral petals placed in the form of a roſe. The flower cup is in the ſhape of a dentated horn, and the flowers themſelves hang on one ſide. They are ſucceeded by ſmall fruit, of the ſize of a grain of wheat; which contains ſeveral ſeeds. It grows in deſarts, wild, ſandy, moiſt, marſhy places, and moſt commonly among water moſs, of a whitiſh red colour, and flowers in June and July. This plant is ſaid to be pectoral, and good againſt all diſorders of the lungs; the doſe is a drachm in powder, and two drachms in infuſion. Boerhaave recommends this laſt in the vertigo, the epilepſy, and diſorders of the eyes.

RUBIA TINCTORUM SATIVA, *cultivated dyer's Madder*, has a long, creeping, ſucculent root, divided into ſeveral branches, and of the thickneſs of a gooſe-quill. It is woody, and red both without and within. It ſends forth long branches, that are ſquare, geniculated, or knotty, and rough; and from each knot there proceed five or ſix oblong leaves, that ſurround the ſtalk in the form of a ſtar; they are hairy, and crenated all round, with ſmall furrows. The flowers grow on the tops of the branches, and conſiſt of a ſingle leaf, which is cut into four or five ſegments, expanded at the top; the flower cup becomes a fruit, compoſed of two juicy berries cloſely joined together, which are black when ripe, and full of juice; each contains a ſeed, which is generally hollowed like a navel, and is almoſt round. It flowers in July and Auguſt, is cultivated in many parts of Europe, and is made uſe of for dying. Though the propagation of it in England has been long neglected, it is now cultivated with greater ſpirit than ever, by which we are ſuppoſed to ſave near thirty thouſand pounds annually. The root is taken out of the earth in May and June, and they dry it for tranſportation. The root is one of the five leſſer opening roots, and is ſaid to reſolve groſs humours, and to be uſeful in obſtructions of the viſcera. Boerhaave affirms, it is good againſt the gravel, and cleanſes the kidnies and bladder from mucous matter. The doſe of the root in powder is a drachm or two, and in decoction from half an ounce to an ounce. It has one very uncommon property, that is, it will turn the bones of thoſe animals red, that have fed upon it for ſome time.

RUBUS VULGARIS FRUCTU NIGRO, *the common Bramble or Blackberry buſh*, has a ſlender, creeping, knotty root, that ſends forth ſeveral long, weak, bending, greeniſh, red, angular, pithy branches, that are armed with ſtrong crooked prickles, which lay hold of the garments of thoſe that paſs by. The leaves are oblong, pointed, dentated on the edges, rough, and brown above, but whitiſh below; they are placed by three's, or five's, on the ſame pedicles, and never fall off in winter, till others come in their places. The flowers on the end of the branches conſiſt of five petals or reddiſh leaves, diſpoſed in the form of a roſe, and the flower cup is cut into five parts, in the middle of which there is a piſtil, ſurrounded with a great number of ſtamina, or chives. Theſe are ſucceeded by round or oval fruit, nearly like mulberries, that are compoſed of ſeveral berries, full of juice, cloſely joined together, that are red at firſt, and black when ripe; each of theſe contain an oblong ſeed. It grows almoſt every where in the fields and woods, and flowers in June, July, and Auguſt: the fruit is ripe in autumn. The root is cleanſing, aſtringent, and abſorbent; and a ſyrup made of the fruit is recommended in heat of urine. Boerhaave affirms, that the roots taken out of the earth in February or March, and boiled with honey, are an excellent remedy againſt the dropſy. The leaves pounded and applied to ringworms and ulcers of the legs, heal them in a ſhort

time. The fruit when ripe is cooling, and quenches thirſt.

RUBUS IDÆUS SPINOSUS FRUCTU RUBRO ET ALBO, the *Raſpberry buſh*, has a long creeping root, divided into ſeveral branches, and ſends forth ſeveral ſtalks, to the height of a man, armed with thorns, that are not very prickly; the leaves are like thoſe of the bramble, but more tender and ſoft, and of a browniſh green above, but whitiſh below. The flowers are white, and conſiſt of five petals, diſpoſed in the form of a roſe, and the calyx is divided into five parts; from the center of which the piſtil ariſes, with many ſtamina, that afterwards turn to the fruit, which is larger than a ſtrawberry. It is round, a little hairy, and compoſed of five berries, joined cloſely together; the colour is generally red, and they are full of a rich vinous juice, and each contain a ſeed. It grows wild in moiſt ſhady woods, and is cultivated in gardens and orchards; it flowers in May and June, and the root is ripe in July, but it will not keep. There are other ſorts of raſpberries, and particularly one, that has white fruit; but they have all the ſame qualities, and are ſaid to be cooling, cordial, and to ſtrengthen the ſtomach. They agree with people of hot conſtitutions, and there is a ſyrup made with them, that is kept in the ſhops.

RUSCUS LATIFOLIUS FRUCTU FOLIO IN NASCENTE, *narrow leaved butcher's broom*, or *Alexandrian laurel, with the fruit growing on the leaves*, has a long, white, hard, knotty, fibrous root, that ſends forth ſtalks to the height of two feet, which are ſmall, flexible, green, round, and furniſhed with pretty thick, broad, nervous, bending leaves, of a beautiful green, and reſembling thoſe of the common bay tree. The flowers proceed from the large nerve of the leaves, and are in the ſhape of little bells, but without pedicles; they are ſmall, and of a greeniſh or pale yellow, with a piſtil in the middle, that becomes a ſoft roundiſh fruit or berry, that is red when ripe, and contains two ſeeds as hard as horn. This ſhrub grows wild in mountainous places, and is cultivated in gardens. It flowers in ſummer, and the fruit is ripe in autumn. The roots are ſaid to be aperient, and to be good in a ſuppreſſion of urine; the leaves are vulnerary, and proper to cleanſe and dry moiſt ulcers.

RUSCUS MYRTIFOLIUS ACULCATUS, the *common Knee-holley, or butcher's broom*, has a thick, crooked, warty, hard, creeping, white root, furniſhed with thick long fibres, and ſends forth ſtalks to the height of two feet, that are tough and hard to break; and are furrowed, and divided into ſeveral branches. The leaves are like thoſe of the myrtle, but more ſtiff and rough, pointed, prickly, nervous, and without pedicles; they are always green, and have a bitter aſtringent taſte. The flowers grow in the middle of the leaf, and conſiſt of a ſingle petal, cut into ſix parts, whoſe ſtamina, being united, are in the ſhape of a bell, but there is no calyx. Theſe are ſucceeded by round berries, as large as peas, ſomewhat ſoft and red when ripe. It grows in rough, ſtony places, and in woods, foreſts, and hedges; it flowers in April and May. There proceed tender ſhoots from the roots in ſpring, that are green, and may be eaten as aſparagus. If they are ſuffered to grow, they become leafy, woody, and tough; and in ſome places they make brooms with them. This plant is ſaid to incide groſs humours, and to carry them off by urine; and the root is one of the five greater opening roots. The doſe is from half an ounce to an ounce in decoction, and has been recommended in the jaundice, dropſy, and gravel. Boerhaave affirms, that the decoction of the leaves, in white wine, is an excellent remedy in the gravel and dropſy, and the doſe is a glaſs in a morning faſting; but it muſt be continued for ſome time.

RUTA HORTENSIS LATIFOLIA, the *common broad leaved garden Rue*, has a woody root, furniſhed with a great number of fibres, and ſends forth ſtalks in the form of a ſhrub, that ſometimes riſe to the height of five or ſix feet; they are as thick as one's finger, woody, divided into ſeveral branches, and covered with a whitiſh bark. The leaves are divided into ſeveral ſegments, and are ſmall, oblong, ſmooth, of a ſea-green colour, and placed by pairs in a rib, terminating in a ſingle leaf. The flowers grow on the tops of the branches, and generally conſiſt of four ſomewhat oval leaves, of a pale yellow; the piſtil ariſes out of the flower cup, which turns to a fruit, conſiſting of four capſulæ, fixed to an axis, that are full of angular ſeeds, in the form of a kidney. It is cultivated every where in gardens, flowers in June, and continues green all the winter.

RUTA SYLVESTRIS MAJOR, the *greater wild Rue*, is ſomewhat like the garden rue, but ſmaller, and the leaves are divided into longer ſegments, which are alſo more narrow, and of a darker green. It grows in the ſouthern parts of Europe, in rough, ſtoney, mountainous places. They both have the ſame virtues, and have a diſagreeable ſmell, with an acrid bitter taſte. The leaves, when in perfection, will bliſter the ſkin, if much handled, and are ſaid to be inciding, attenuant, and diſcuſſive; therefore they are proper, as they have alſo a ſtimulating quality, to quicken the circulation of the fluids, to diſſolve groſs humours, and to open obſtructions of the glands. Boerhaave had a high opinion of it, and affirms nothing can be more proper to promote ſweat and perſpiration, and to cure the hyſteric paſſion, and the epilepſy. An extract, made with the rectified ſpirit, contains the whole virtue of the rue. The doſe of the juice is to two ounces; but the leaves are beſt for thoſe that can eat them; or they may be taken in powder, from a ſcruple to a drachm, or the infuſion may be drank as tea.

SABINA MAS, the *common Savine*, has a ſtrong, woody root, that ſends forth a ſtem or ſhrub, that extends more in breadth than in height, and is always green. The leaves are like thoſe of German tamariſk, but are more hard and thorny, and have a ſtrong diſagreeable ſmell, with an acrid burning taſte. On the top of the branches there are catkins or flowers, that have three ſtamina without petals, and which are not ſucceeded by any fruit; however, if the ſhrub be very old, it ſends forth ſmall greeniſh flowers, that are ſucceeded by ſmall flattiſh berries, leſs than juniper berries, that are of a blueiſh black when ripe. It is cultivated in gardens, but in our climate ſeldom or never yields any fruit.

SABINA FOLIO CUPRESSI, the *berry-bearing upright Sabine*, has a root like the former, but produces a higher ſtem, for it riſes to a ſort of a tree, whoſe wood is reddiſh within, and is covered with a reddiſh pretty thick bark. The leaves are like thoſe of the cypreſs tree, but more compact, with a ſtrong penetrating ſmell, and a bitter, aromatic, reſinous taſte. The flowers conſiſt of three pointed petals, as well as the calyx, which is divided into three parts, and is of a yellowiſh colour. The berries are roundiſh, fleſhy, and on the lower part there are three tubercles, with a navel, armed with three ſmall teeth, and they contain three oblong ſtones, that are convex on one ſide, and angular on the other. It grows among mountains, woods and other uncultivated places, and is alſo planted in gardens. The firſt is only uſed in medicine, and is inciding, penetrating and aperient. The doſe of the leaves in infuſion, is half an ounce, and, in powder, to a drachm, in a glaſs of white wine. The diſtilled oil taken upon a lump of ſugar, has the ſame virtues, and is employed by ſome to kill worms. This plant is a good remedy for opening obſtructions

obſtructions of the viſcera, proceeding from a weakneſs of the veſſels, and the clammineſs of the fluids.

SALICARIA, *ſive* LYSIMACHIA PURPURA, *purple ſpiked Willow herb, or Looſe Strife, with long leaves*, has a thick, woody, white, perennial root, with branches that ſometimes riſe to the height of a man, that are ſtiff, angular, branched, and reddiſh. The leaves are oblong, pointed, narrow, and of a deep green; they proceed from the knots of the ſtalks by pairs, and ſometimes by threes, but very ſeldom by fours; they ſurround the ſtalks by intervals, and have a dry aſtringent taſte. The flowers are verticillated in the middle of the branches, and are collected in ſpikes, of a fine purple colour, and each conſiſts of ſix leaves or petals, in the form of a roſe, with twelve ſtamina of the ſame colour, placed in the middle. The piſtil riſes from the middle of the flower-cup, and turns to a huſk, or oblong pointed capſula, divided into two cells, full of ſmall ſeeds. It grows in moiſt marſhy places, and by the ſides of waters and rivers; it generally flowers in June and July. This plant is deterſive, aſtringent, vulnerary, and cooling, but is ſeldom uſed in medicine, though ſome pretend it is an excellent remedy againſt the bloody-flux.

SALIX VULGARIS ALBA ARBORESCENS, *the common white Willow tree*, has a long, woody, white root, that produces a pretty large tree, with many firm green branches, covered with a ſmooth ſoft bark; the wood is white, pliant, and difficult to break. The leaves are long, narrow, downy, whitiſh, ſoft, and more or leſs dentated on the edges. The flowers and fruit grow diſtinctly from each other, and the male has only catkins, or long ſcaly ſpikes without petals, but there are two ſtamina in the center. The female willow has catkins like the former; but they have an oval, pointed piſtil, ſomewhat longer than the fruit, which afterwards becomes a bivalved capſula of the ſame ſhape, full of oval tufted ſeeds. It grows every where in moiſt marſhy places, and on the ſides of brooks and rivers.

SALIX CAPREA *ſeu* MINOR, *ſeu* SALIX LATIFOLIA ROTUNDA, *the round leaved Willow*, has a root like the former, which produces a pretty large ſhrub, covered with a whitiſh bark. The leaves are roundiſh, broad, nervous, of a deep green above, and whitiſh and downy below, and the pedicle is often furniſhed with two ſmall leaves, cut like ears; the catkins and flowers grow in diſtinct places, and it delights in moiſt woods, and along the ſides of rivers and ditches, and is common in hedges. It flowers in March and April, and the wood, though more brittle than the white willow, ſerves to make hoops for barrels. The bark, leaves, and catkins, are ſaid to be cooling and aſtringent, and they have been uſed in decoctions, and in all kinds of hæmorrhages, but they are now out of uſe.

SALVIA MAJOR, *the greater or common Sage*, has a perennial, hard, woody, fibrous root, with woody, branched, hairy, white, green ſtalks, generally ſquare, with leaves placed oppoſite to each other; theſe are oblong, broad, obtuſe, wrinkled, rough, and whitiſh, inclining to purple, and ſometimes other colours; they are downy, thick, have a little juice, and are crenated on the edges. The flowers grow in ſpikes on the tops of the branches, and conſiſt of a ſingle labiated petal, with two ſtamina; they are of a bluiſh colour, inclining to purple, and are contained in a large calyx, in the ſhape of a horn, that is cut into five ſegments, and has the ſmell of turpentine. Theſe are ſucceeded by four roundiſh blackiſh ſeeds, contained in a huſk, that before was the flower-cup. It is cultivated in gardens, and flowers in June and July.

SALVIA MINOR, *ſive* PINNATA, *Sage of Virtue*, has a root like the former, with ſeveral woody, whitiſh, downy ſtalks, as long as thoſe of the common ſage; but the leaves are leſs, whiter, wrinkled, rough, and generally attended at the baſe with two ſmall leaves, in the ſhape of ears or wings. The ſmell and taſte are ſtronger, more penetrating and aromatic. The flowers and ſeeds are like the former, and it is cultivated in gardens.

SALVIA HISPANICA, *Spaniſh Sage, with a lavender leaf*, ſomewhat reſembles the former, but is leſs, and the leaves are narrower, and more white, as well as the flowers. It flowers in ſummer, but is very tender, and will not bear the cold very well. They may be all planted by ſlips, during any of the ſummer months, obſerving to ſhade and water them till they have taken root; after which they may be taken up and planted in a dry ſoil, where they may have the benefit of the ſun. Sage of virtue is by moſt accounted the beſt, though the properties of all are much the ſame; they are cephalic, and very good againſt the apoplexy, epilepſy, palſy, and trembling of the limbs. They are all uſed in the manner of tea, againſt any of the diſorders abovementioned, as well as for a preſervative, and are very good for diſorders of the brain, to promote the circulation of the fluids, to ſtrengthen the ſtomach, and to help digeſtion. It is commonly ſaid, that the Chineſe wonder we ſhould buy their tea, when we have ſo much ſage of our own, which they take to be much more excellent. As to outward uſe, the leaves and flowers are often employed in fomentations, to ſtrengthen the nerves, and to diſcuſs the ſwellings of wounds.

SAMBUCUS FRUCTU IN UMBELLA NIGRO, *the common Elder tree with black berries*, has a woody, long, whitiſh root, and ſometimes grows to a middle ſized tree. The branches are large, round, and full of a white pith, that is green at firſt, and afterwards grey. The trunk is covered with a rough, aſh coloured bark, full of cracks, under which there is another, which is green, and is uſed in medicine. There are five or ſix leaves that grow on one rib, which are dentated on the edges, and each rib is terminated with a ſingle leaf, that is larger than the reſt. The flowers grow at the tops of the branches in umbels, and conſiſt of a ſingle petal divided into five ſegments, that expand in the form of a roſe; they are white, ſmall, and have five ſtamina, with roundiſh apices; theſe are ſucceeded by ſoft, round, juicy berries, that are green at firſt, but black when ripe, and there are generally three ſeeds in each. It grows almoſt every where, in all parts of Europe, but delights in valleys and moiſt ſhady places. It flowers in May and June, and the berries are ripe in autumn. All parts of this tree are in uſe, and are generally known to have a purging and aperient quality. The doſe of the rob of elder berries is from a drachm to half an ounce, in the bloody-flux, and to promote urine and ſweat. The uſe of elder-berries in made wines is univerſally known.

SANICULA, *Sanicle*, has a thick root above, that is fibrous below, blackiſh without, and white within. It ſends forth ſeveral broad roundiſh leaves, that are a little hard, ſmooth, dentated on the edges, and of a fine green ſhining colour; from among theſe there ariſes a ſtalk to the height of a foot, that is ſmooth, without knots, and reddiſh towards the root, and on the top there are ſeveral ſmall flowers collected into an umbel, conſiſting of five white or red petals, placed in the form of a roſe, with five ſtamina, and roundiſh apices. The petals are generally bent back to the calyx, on which they reſt, and which turns to a fruit compoſed of two ſeeds, convex on one ſide, flat on the other, and prickly at the points, by which means they ſtick to the garments of thoſe that paſs by. Some of the flowers are always barren. It delights in ſhady woods, and in a flat moiſt ſoil, and

flowers

flowers in June. It has been long noted for its vulnerary virtues, and may be uſed in the manner of tea; but it is not now depended upon for any ſuch purpoſe.

SATUREIA HORTENSIS, *garden Savory*, has a ſmall, ſingle, woody root, with ſtalks that riſe to the height of a foot, or a foot and a half, which are round, reddiſh, and a little hairy and knotty. The leaves are ſma'l and oblong, like thoſe of hyſſop; they are a little hairy, and ſeem to have ſeveral holes, with a ſmell like that of thyme, but weaker. The flowers are ſmall and labiated, conſiſting of a ſingle petal; whoſe upper lip or creſt is divided into two parts, but the lower lip or beard is divided into three, and has the middle part crenated; they proceed from the places where the leaves join to the ſtalk, ſomewhat looſely, but not in whorls or ſpikes, like moſt of this kind. They are white or purpliſh, with four ſilky ſtamina, that are ſucceeded by as many browniſh round ſeeds, contained in a capſula, that was the cup of the flower. It is cultivated in gardens, by ſowing the ſeeds on a bed of freſh light earth, in March; and when the plants are come up, they muſt be moved into other beds, placing them about four or five inches aſunder each way. It flowers in the ſummer. It is aperient, inciding, and ſtrengthening, but it is chiefly cultivated for the uſe of the kitchen, and is very proper for cold ſtomachs.

SAXIFRAGA ALBA RADICE GRANULOSA, *white round leaved Saxifrage*, has a root that ſends forth ſeveral fibres, at the top of which there are ſeveral tubercles, ſomewhat larger than coriander ſeeds, which are partly purple, and partly white, and of a bitteriſh taſte. The leaves are almoſt round, crenated on the edges, and pretty much like thoſe of ground-ivy, only they are thicker and whiter. Among theſe the ſmall ſtalks riſe to the height of a foot, and are tender, hairy, purpliſh, and branched. The flowers grow on the top, and have five white leaves or petals, placed in the form of a roſe, that have ſix ſtamina, with roundiſh apices. The flower-cup is divided into ſeveral ſegments, out of which the piſtil ariſes, that, together with the flower-cup, turns into a roundiſh fruit, with two horns, and two cells full of ſmall, longiſh, reddiſh ſeeds. This plant is common in moiſt meadows, in divers parts of England, and flowers in May. It is ſaid to be good in diſorders of the breaſt, and particularly in the moiſt aſthma; but it is now almoſt neglected.

SAXIFRAGA VULGARIS, *Meadow Saxifrage*, has a perennial, long, thick, wrinkled root, white within, and hairy at the top, with ſtalks that riſe from one foot to two in height, which are thick, round, furrowed, ſmooth, pithy, reddiſh towards the bottom, and branched. The leaves are ſmooth, of a deep green, and divided into longiſh, narrow-pointed, ſtiff ſegments, with an acrid taſte. The flowers, which grow on the tops of the branches in umbels, have five leaves or petals in the form of a roſe, of a whitiſh yellow. Theſe are ſucceeded by fruit, compoſed of two ſhort furrowed ſeeds, convex on one ſide, and flat on the other; they have a ſtrong pleaſant ſmell, and a vinous aromatic taſte. It grows almoſt every where in moiſt places, and has been looked upon as exceeding good for the gravel, the root being a powerful diuretic; but it is not now much uſed for that purpoſe.

SCILLA VULGARIS RADICE RUBRA, *common red Squill*, has a root like an onion, or a bulb, ſometimes as large as a child's head, compoſed of thick, red, juicy, clammy coats, placed one upon another, and underneath there are large fibres. It ſends forth leaves a foot in length, and as broad as the hand, that are fleſhy, green, and full of a clammy bitter juice. In the middle of theſe there ariſes a ſtalk to the height of a foot and a half, on the top of which there are flowers, with ſix white petals, but without a calyx, diſpoſed in a ring, and as many oblong ſtamina. Theſe are ſucceeded by roundiſh fruit, on which are three corners, and they are divided into three cells, full of roundiſh black ſeeds. The root only is in uſe.

SCILLA RADICE ALBA, *the white Squill*, has a large root, but leſs than the former, and compoſed of ſeveral white coats, full of a clammy juice, and furniſhed underneath with many pretty thick fibres. It ſends forth an upright naked ſtalk, to the height of a cubit, adorned at the top with ſeveral white flowers in the form of a ſtar. The flowers appear before the leaves, and after them ſix thick, fleſhy, large, deep, green leaves, proceed from the root, and lie upon the ground. This, as well as the former, grows in ſandy places near the ſea, and flowers in Auguſt and September. The ſeeds are ripe in November and December. Theſe roots are brought from the Levant and Spain every year, and deſerve to be cultivated in every good garden, for the beauty of their flowers. Thoſe roots ſhould be choſen that are freſh, of a middle ſize, ſound, heavy, firm, and full of a clammy, bitter, acrid juice. They are excellent in diſorders of the lungs, cauſed by a clammy, viſcous phlegm; for which reaſon they perform wonders in the fits of the moiſt aſthma, and in a diſpoſition to a dropſy. However, in ſwellings ariſing from the dropſy, and in the inflammation of the kidnies, they are beſt given with nitre; that is, there ſhould be double the quantity of this to that of the root; and the doſe of the latter, in powder, is from four to ten grains. When given in this manner, it almoſt always operates as a diuretic. There are ſeveral preparations of this root kept in the ſhops.

SCORDIUM ALTERUM, *ſive* SALVIA AGRESTIS, *wood Sage*, has a woody, flexible, creeping, fibrous, perennial root, that ſends forth ſeveral ſquare, hairy, purpliſh, branched, pithy ſtalks, to the height of two or three feet. The leaves reſemble thoſe of ſage of virtue, only they are broader and ſofter, like balm; they are alſo wrinkled, downy, of a dirty green, dentated on the edges, and have a bitter taſte. The flowers grow in ſpikes, and conſiſt of a ſingle labiated petal, like thoſe of Germander, and have the ſame ſhape, but are of a pale white colour, with four purple ſtamina, that are ſucceeded by four roundiſh, blackiſh ſeeds, contained in a capſula, that was the cup of the flower. It grows in uncultivated ſandy places, and among hedges. It flowers in the ſummer, and continues a long while in flower. It has ſomewhat of a garlick ſmell, and is ſaid to ſtrengthen the ſtomach, kill worms, and promote urine; but it is now neglected.

SCORSONERA, *ſive* SCORZONERA, *Viper's Graſs*, has a root a foot long, as thick as one's thumb, blackiſh without, white within, and eaſy to be broken; it is full of a ſweetiſh milky juice, and ſome account it good eating. It ſends forth a round, furrowed, hollow ſtalk, to the height of two feet, covered with a little down, and divided into ſeveral branches. The leaves are long, pretty broad, ſmooth, and embrace the ſtalk by their baſe; they are ſometimes a little ſinuated or curled at the edges, terminating in a long narrow point, and are of a dark green colour. The flowers grow on the tops of the branches, and are large, yellow, and compoſed of ſemi-florets, with a long, ſlender, ſcaly flower-cup; theſe are ſucceeded by long white ſeeds, tufted at the top. It is cultivated in many kitchen gardens about London, and flowers in May and June. The root is accounted good both for food and phyſic; for it is ſaid to ſtrengthen the ſtomach, and to promote urine and ſweat. Some take the boiled root to be very good food, and affirm it agrees with all ages and ſexes.

ſexes. The juice of the root, taken to three ounces in a morning faſting, Boerhaave affirms to be good in hypochondriac diſeaſes, and to open obſtructions of the viſcera.

SCROPHULARIA AQUATICA, *water Betony*, has a thick perennial root, furniſhed with long fibres, and ſeveral ſtalks, that riſe to the height of two or three feet; theſe are ſquare, thickiſh, reddiſh in ſome places, and green in others, hollow within, pretty tender, full of juice, ſmooth, and branched. The leaves are like thoſe of the former, but more blunt at the end, and twice or thrice as large; they have a diſagreeable ſmell and taſte. The flowers are like thoſe of the former, but a little larger, and of a reddiſh, ruſty colour. Theſe are ſucceeded by round pointed fruit, divided into two cells, that contain very ſmall brown ſeeds. It is common in all watery places, and flowers in July and Auguſt. It is ſaid to be an excellent vulnerary, and to have the ſame virtues as the former in other reſpects; but it is not now in much eſteem.

SEDUM MAJUS VULGARE, *common great Houſe Leek*, has a ſmall fibrous root, with many oblong, thick, flat, pointed, fleſhy, juicy leaves, that grow cloſe to the ground; they are always green, and ranged in a circular order, in the form of a roſe, they being convex without, and flattiſh within, and have a very little down on their edges. A thick, reddiſh, pithy ſtalk ariſes from the middle of theſe, cloathed with the ſame ſort of leaves as the former, only they are more narrow and pointed. It is divided at the top into ſeveral branches, on which are flowers, with five petals, placed in the form of a roſe, and of a purple colour, with ten ſtamina, that have roundiſh apices or ſummits. The piſtil riſes from the flower-cup, which afterwards turns to a fruit, compoſed of many ſeed veſſels, reſembling huſks, that are collected into a ſort of a head, and are full of ſmall ſeeds. It grows on the top of old walls, and on the roofs of houſes; it flowers in July, and the ſtalk withers away in the autumn, when the ſeed is ripe. This plant is ſaid to be cooling, cleanſing, and aſtringent, and ſome give four ounces of the juice, to cure intermitting fevers, when there is no cold fit.

SEDUM PARVUM ACRE FLORE LUTEO, *Wall Pepper, or Stone Crop*, has a ſmall fibrous root, with ſeveral low, ſhort, ſlender ſtalks. The leaves are very ſmall, ſomewhat thick, fat, pointed, triangular, and full of juice; the flowers are yellow, and conſiſt of ſix petals in the form of a ſtar, with many ſtamina and apices, or ſummits, of the ſame colour in the middle, that are ſucceeded by ſeveral ſheaths or ſeed veſſels, collected in the form of a head, and full of ſmall ſeeds. It grows almoſt every where ſuſpended by its roots, or lying on old walls, and on the tops of cow houſes; it flowers in June, and has a pungent, hot, burning taſte. It is looked upon by ſome as an excellent remedy for the ſcurvy, and is particularly good for ulcerated gums, occaſioned by that diſtemper.

SENECIO MINOR VULGARIS, *common Groundſel*, has a ſmall, whitiſh, fibrous root, with ſeveral round, furrowed, hollow ſtalks, that riſe to the height of a foot; theſe are ſometimes reddiſh, branched, and hairy in certain places, expoſed to the ſun. The leaves are oblong, jagged, dentated, placed alternately, fixed to the ſtalks by a broad baſe, and terminate in a blunt point; the colour is of a dark green, and the flowers are placed in bunches at the top of the ſtalks; they conſiſt of many yellow florets, diſpoſed in the form of ſtars, and contained in a flower-cup, conſiſting of a ſingle leaf, with five ſmall ſtamina, that have cylindric apices or ſummits in the middle; theſe are ſucceeded by downy ſeeds, that altogether form a white head. It grows every where in fields, and by the way ſides, in ſandy places expoſed to the ſun; as ſoon as the leaves wither, others ariſe; inſomuch that it continues green all the year, and flowers in all ſeaſons. It is accounted emollient and reſolvent, and the juice, given to two ounces, kills worms. Some account it good in the jaundice, and even in ſpitting of blood. Boerhaave recommends the juice, mixed with oxycrate, as a gargle, in inflammations of the throat.

SERPYLLUM VULGARE MINUS, *Mother of Thyme*, has a ſmall, woody, perennial, brown root, furniſhed with capillary fibres, as alſo ſeveral ſmall, ſquare, woody, reddiſh, and low ſtalks, that are ſomewhat hairy. The leaves are ſmall, green, roundiſh, nervous, a little broader than thoſe of common thyme, and have an acrid, aromatic taſte. The flowers grow on the tops of the ſtalks, diſpoſed like a head, and generally of a purple colour; they conſiſt of a ſingle labiated petal, that has two lips, and is placed in a calyx, made like a horn. Theſe are ſucceeded by ſmall roundiſh ſeeds, contained in a capſula, that was the cup of the flower. It grows in uncultivated, mountainous, dry, ſandy, ſtony places, and flowers in the ſummer. There are ſeveral ſorts, but they have all the ſame virtues, and are accounted cephalic and ſtomachic, and may be uſed in the ſame manner as common thyme, though they are not quite ſo efficacious.

SILIQUASTRUM, *ſive* ARBOR JUDÆ, *Judas's tree*, has a thick, hard, woody, perennial root, that ſends forth a trunk, which in time becomes a middle ſized tree, and is divided into branches at conſiderable diſtances from each other; the bark is of a blackiſh purple colour, on which papilionaceous flowers appear in the ſpring of a beautiful purple colour, and ſeveral of them are placed together; they are compoſed of five petals or leaves, the two lowermoſt of which are larger than the upper, which is contrary to other flowers of the leguminous kind. The piſtil riſes from the center of the flower-cup, is ſurrounded with ſtamina, and afterwards becomes a long flat pod, containing ſeveral ſeeds in the ſhape of kidneys. After theſe the leaves appear, which are round, and placed alternately on the branches; they are nervous, green above, and whitiſh below; the pods that contain the ſeeds are ſix inches in length, and very flat, purple, membranous, ſemi-tranſparent, and made in ſome ſort like the ſheath of a knife. This tree grows in hot countries, near rivers and brooks, on mountains and in valleys; it is cultivated in gardens for its beauty, and flowers in April and May. It was formerly preſerved in green-houſes as a curioſity; but of late years has been tranſplanted into the open air, where it thrives very well. It may be propagated by ſowing the ſeeds on a bed of light earth, towards the middle of April, and earth ſhould be ſifted over them to the thickneſs of half an inch; if the ſeaſon proves wet, the bed ſhould be covered with mats. Some few of the plants riſe the firſt year, but the greateſt number in the ſecond. About the middle of April following, juſt before they begin to ſhoot, they ſhould be taken up carefully without breaking their roots, and planted in freſh ground as ſoon as poſſible. After they have continued here two or three years, they may be removed to the places where they deſign to remain. It is of little or no uſe in medicine, though the pods are ſaid to be aſtringent. In the ſouthern parts of France, the flowers are eaten as a ſallad; but they are beſt when pickled like capers before they open.

SINAPI SILIQUA LATIUSCULA GLABRA SEMINE RUFO, *ſive* VULGARE, *common or red Muſtard*, has a white, woody, brittle root, furniſhed with fibres, that ſends forth a ſtalk to the height of four or five feet, which is pithy, hairy below, and divided into ſeveral branches. The leaves are large, and

and much like thoſe of radiſhes, but ſmaller and more rough. The ſmall yellow flowers grow at the top of the branches, and conſiſt of four leaves in the form of a croſs; the piſtil ariſes out of the flower-cup, which turns to a fruit or pod, divided into two cells by a partition, to which the valves adhere on both ſides, and are full of roundiſh, reddiſh, or blackiſh ſeeds, of an acrid biting taſte. This grows wild on the ſides of ditches, among ſtones, and on land newly broken up, particularly in the Iſle of Ely, where the land has been flooded for many years, and has afterwards been drained. It is alſo cultivated in gardens, and flowers in June.

SINAPI ALBUM, *ſive* HORTENSE SEMINE ALBO, *garden, or white Muſtard*, has a ſingle, woody, white root, furniſhed with long fibres, and ſends forth a ſtalk to the height of a foot and a half, or two feet, which is branched, hairy, and hollow. The leaves are like thoſe of radiſhes, and armed above and below with ſtiff prickly hair. The flowers are ſmall, yellow, in the form of a croſs like thoſe of the former, and are ſucceeded by hairy pods, that terminate in an empty point, and contain four or five round, whitiſh or reddiſh ſeeds, that ſeem to be articulated or knotted. It grows wild in fields among the corn, and is cultivated in gardens; it flowers in May and June, and the ſeeds are ripe in July and Auguſt. Both kinds have the ſame properties, though the former is generally preferred. The ſeeds are ſtomachic, diaphoretic, antiſcorbutic, and are good in hypochondriac diſeaſes, as well as in ſleepy diſorders. The common uſe of muſtard is known to every one, and is very proper for people of a cold conſtitution; becauſe it creates an appetite, helps digeſtion, and attenuates the food. The powder of muſtard ſeed, taken in white wine, is excellent againſt the ſcurvy, and ſome affirm it will cure a quartan ague, if taken in hot wine two hours before the fit. Some apply muſtard outwardly to cure the hyp-gout, and alſo lay it to the feet, mixed with other things, in dangerous fevers. The white muſtard is uſed as a ſallad herb, eſpecially in winter, and in the ſpring. There are two other ſorts of this plant, but theſe are the moſt uſeful.

SISARUM GERMANORUM, *the Skerrit*, has a root compoſed of ſeveral parts, as long as a man's hand, and as thick as the little finger, which are tender, brittle, wrinkled, and fixed to a ſort of a neck; they are covered with a thin pale rind, and have a white pulp. The branches riſe to the height of two or three feet, and are thick, knotted, and furrowed; the leaves are winged, and placed by pairs oppoſite to each other, on a rib that terminates in a ſingle leaf, which is longer and broader than the reſt; they are greener and ſofter than thoſe of parſnips, and are ſlightly crenated on the edges. The flowers grow in umbels on the top of the ſtalks, and conſiſt of four white leaves, placed in the form of a roſe, with as many ſtamina in the middle. The flower-cup afterwards turns to a fruit, compoſed of two oblong ſeeds, which are furrowed on the back, and of a dark colour. It is cultivated in the kitchen garden, and flowers in June. It is thought by ſome to be the moſt wholeſome and nouriſhing of all kinds of roots, though it is not very common in the gardens near London, but for what reaſon it is hard to ſay. It may be propagated by ſowing the ſeeds about the middle of April, upon a moiſt, rich, looſe ſoil; the plants will come up in May, and, when the leaves are decayed, the roots may be taken up for uſe as they are wanted; they will continue good in the ground from October till March, after which they are good for nothing. They are accounted good for all ages and conſtitutions; Boerhaave looks upon them as one of the beſt remedies for piſſing and ſpitting of blood, and would have them dreſſed ſeveral ways, that the patient may feed frequently upon them, eſpecially if inclined to a conſumption.

SISYMBRIUM AQUATICUM, *Water-radiſh, with dentated leaves*, has a long flexible root, furniſhed with fibres, and has a taſte like that of radiſhes. It ſends forth ſeveral branched, hollow, furrowed ſtalks, to the height of three feet; the leaves are large, long, ſinuated, dentated on the edges, and eſpecially towards the lower part. The flowers grow on the top of the branches, and conſiſt of four yellow petals or leaves, diſpoſed in the form of a croſs; the piſtil proceeds from the flower-cup, that afterwards turns to a fruit or pod, which is divided into two cells by a partition, to which the valves adhere on both ſides, and contain ſmall roundiſh ſeeds. It grows in marſhes, brooks, rivers, ditches full of water, and flowers in ſpring. It is obſervable, that the leaves differ greatly from each other, according to the places in which they grow.

SISYMBRIUM SILVESTRE, *ſive* RHAPHANUS AQUATICUS, *Water-radiſh*, has an oblong white root, as thick as a man's little finger, that has an acrid pungent taſte; the ſtalks, which riſe to the height of three feet, are furrowed, hollow, and ſometimes reddiſh. The leaves are oblong, pointed, cut deeply into jags, dentated on the edges, and are placed alternately on the ſtalks. The flowers grow on the tops of the ſtalks and branches, and are ſmall, conſidering the ſize of the plant; they conſiſt of four yellow petals or leaves, diſpoſed in the form of a croſs, with ſix ſtamina; they are ſucceeded by ſmall ſhort pods, divided into two cells, that contain ſmall roundiſh ſeeds. It grows in ditches full of water, and in marſhy places; it flowers in June and July. Some account the roots of both kinds good to eat, and uſe them in the ſame manner as radiſhes. They are aperient, cleanſing, good againſt the gravel, ſcurvy, and dropſy; but they are ſeldom uſed either for food or phyſic.

SISYMBRIUM PALUSTRE REPENS NASTURTII FOLIO, *Water Rocket*, has a creeping, ſlender, whitiſh root, with an acrid taſte, but not ſo ſtrong as that of radiſh; the ſtalks are ſhort, furrowed, ſlightly perforated, and are ſometime reddiſh, and like thoſe of the garden creſſes. The flowers grow at the top of the branches, and are ſmall, conſiſting of four yellow leaves or petals, that are ſucceeded by ſmall cylindric pods, which are longer than thoſe of the former kinds, and are divided into two cells by a partition, containing ſeveral ſmall ſeeds. It grows on the ſides of rivers in moiſt ditches, and in ſtony brooks; it flowers in July and Auguſt. It has the ſame virtues as the two former, but is now made little or no uſe of.

SISYMBRIUM ERUCÆ FOLIO GLABRO FLORE LUTEO, *Common winter creſſes*, has a long, pretty thick, white, perennial root, with an acrid taſte; the ſtalks are furrowed, firm, branched, pithy, hollow, and riſe to the height of a foot and a half. The leaves are ſmaller than thoſe of radiſhes, and are ſomewhat like creſſes; they are of a deep, ſhining green; but have not ſo acrid a taſte as the root. The tops of the ſtalks and branches are adorned with long ſpikes of yellow flowers, compoſed of four petals in the form of a croſs; theſe are ſucceeded by ſlender, long, tender, cylindric pods, full of many ſmall reddiſh ſeeds. It grows on the ſides of ditches and brooks, and ſometimes in fields; it is alſo cultivated in gardens for ſallads, in ſome parts of Europe; it flowers in May and June, and continues green all the winter. It is cleanſing and vulnerary, and is good in the beginning of a dropſy, made uſe of in the manner of tea.

SMILAX LÆVIS MAJOR, *greater Bind Weed*, has a long, ſlender, whitiſh, perennial root, furniſhed with

with fibres; and the ſtalks are long, ſlender, furrowed, and climb upon trees and buſhes, by means of their claſpers. The leaves are in the ſhape of a heart, and are bigger and ſofter than thoſe of ivy; they are alſo ſmooth and green, and the flowers are in the form of a bell, and as white as ſnow. The calyx is oval, and divided into five parts, with as many ſtamina, and flattiſh ſummits. Theſe are ſucceeded by round fruits as big as cherries, wrapt up in the calyx, and contain two angular or pointed ſeeds, of a blackiſh colour, with a reddiſh caſt. It is milky like other plants of the ſame kind, and grows almoſt every where amongſt hedges and buſhes; it flowers in ſummer, and the fruit is ripe in autumn. This plant is purgative and vulnerary, and the milky juice is of the ſame nature as ſcammony; but it muſt be given in a larger doſe, that is, from twenty grains to thirty.

SMILAX LENIS MINOR, *ſmall Bind Weed*, has a very long, ſlender, creeping, perennial root, with many ſmall, weak, ſlender branches, that wind round the neighbouring plants. The leaves are in the ſhape of a heart, but more rough, nervous and ſmall, than the former. The flowers proceed from the places, where the leaves join to the ſtalks, like ſmall, whitiſh bells; but they are ſometimes reddiſh or purpliſh. Theſe are ſucceeded by roundiſh, ſmall fruit, containing pretty large angular ſeeds. It is an anodyne, cleanſing, vulnerary plant, and country people often uſe it to heal wounds, by applying it after it has been bruiſed between two ſtones; many are laviſh of their praiſe of this plant on that account. There is another ſpecies of this plant, called the rough Bind Weed, with a red fruit; but it is of no uſe in medicine.

SOLANUM HORTENSE, *Common Night-ſhade, of the ſhops, with black fruit*, has a long, ſlender, hairy, dirty, whitiſh root, with a firm, angular ſtalk, that riſes to the height of a foot and a half, is of a blackiſh green colour, and divided into ſeveral branches. The leaves are oblong, pretty large, ſoft pointed, and blackiſh; whereof ſome are angular, others crenated, others whole, ſmooth, and full of a greeniſh juice. The flowers grow on the branches, a little under the leaves, and conſiſt of a ſingle petal, divided into five parts, and expanded in the form of a ſtar; there are as many yellow ſtamina, with oblong ſummits, and a piſtil, which afterwards becomes a berry, like thoſe of the juniper-tree; it is green at firſt, but when it is ripe it is ſoft, ſmooth, black, and full of juice. It grows on the ſides of highways, near hedges and houſes, and flowers in Auguſt and September. Some ſorts of this plant have red fruit, and others yellow, which ſeems to be the principal differences. Some have given the leaves and fruit inwardly, but very raſhly; for they are often attended with dangerous conſequences, and therefore it is better to abſtain from it entirely.

SOLDANELLA MARINA, *Scottiſh Scurvy-graſs*, or *Soldanella*, has a ſmall fibrous root, with ſeveral ſlender, pliant, reddiſh ſtalks, that creep on the ground; the leaves are roundiſh, ſmooth, ſhining, like thoſe of the leſſer celandine, but thicker, and full of a milky juice. The flowers conſiſt of a ſingle petal, in the ſhape of a bell, and are of a purple colour. The piſtil, which riſes from the lower part of the calyx, turns to a roundiſh membranous fruit, that contains angular black ſeeds. It grows frequently on the ſandy ſhores of the ſea, and flowers in ſummer; the whole plant is dried with the root, in which manner it is ſent to us. It has a bitter, acrid taſte, that is ſomewhat ſaltiſh, and is looked upon by ſome as very proper to purge off watery humours, particularly in a dropſy, palſy, and the rheumatiſm. The doſe of the powder, when dried, is from half a drachm to a drachm.

SONCHUS LÆVIS, *Smooth Sow Thiſtle*, has a ſmall, white, fibrous root, and a hollow, tender, furrowed, purpliſh ſtalk, that riſes to the height of a foot and a half. The leaves are long, ſmooth, larger and more tender than thoſe of dandelion, and are dentated on the edges. They are ranged alternately, are full of a milky juice, and ſome of them embrace the ſtalks with their broad baſes. The flowers grow on the tops of the ſtalks and branches in bunches, and conſiſt of yellow ſemi-florets, like thoſe of dandelion, but ſmaller; theſe are ſucceeded by fruit, of a conical ſhape, that contain oblong, reddiſh, brown ſeeds, with a downy tuft. It grows almoſt every where, and flowers in May and June; rabbits and hares are fond of this plant.

SONCHUS ASPER, *prickly Sow Thiſtle*, has a root like the former, but the leaves are more entire, reſembling thoſe of endive, and they embrace their ſtalk with their baſe; they are of a deep ſhining green, and furniſhed with long hard prickles. It grows in the ſame places as the former, and flowers at the ſame time; it is full of a milky bitter juice. They are both of little or no uſe in phyſic.

STACHYS MAJOR GERMANICA, *baſe Hoar-hound*, has a hard, woody, fibrous, yellowiſh, perennial root, with ſeveral ſtalks that riſe to the height of two feet, which are thick, ſquare, knotted, white, downy, and pithy. The leaves are placed oppoſite to each other at each knot, and are like thoſe of white hoar-hound, but longer, and whiter, and as well downy as dentated on the edges. The flowers are verticillated, and diſpoſed like ſpikes on the top of the ſtalks, between the leaves; they are downy without, ſmooth within, and generally of a purple colour, though ſometimes white; they conſiſt of a ſingle petal in the form of a tube, cut on the upper part into two lips, the uppermoſt of which is hollow like a ſpoon, and erect; but the upper lip is divided into ſix ſegments, of which the middlemoſt is much the largeſt; the piſtil riſes from the flower-cup attended by four embryoes, that turn to as many roundiſh blackiſh ſeeds, contained in a capſula that was the cup of the flower. It grows in mountainous uncultivated places, and is cultivated in gardens, where it is propagated by ſeeds; it flowers in June and July. It is of little uſe in medicine, though Boerhaave recommends it againſt the apoplexy and the palſy.

STATICE, *Thrift*, or *Sea Pink*, has a long, thick, round, reddiſh, woody, perennial root, with ſeveral heads; from whence proceed a great number of long narrow leaves, like thoſe of graſs, and of a ſea-green colour. From among theſe ſeveral ſtalks ariſe, to the height of a foot, that are upright, knotty, hollow, and almoſt all naked; the bunch of flowers grow at the top, and conſiſt of five ſmall whitiſh petals, in the form of a pink, and the calyx in the ſhape of a funnel, beſides which there is a general ſcaly calyx. They are ſucceeded by ſeeds, pointed at each end, and contained in a capſula, that was the cup of the flower. It grows wild in Germany, and other inland countries, from whence it has been brought into England, and planted in gardens, to make edgings, and the ſides of borders of flower-gardens; but it is now almoſt neglected, becauſe they require tranſplanting every year. It continues a long while in flower, even to the very end of autumn. Boerhaave recommends this plant as an aſtringent vulnerary, and proper to ſtop internal hæmorrhages; for which purpoſe the juice is to be drank.

SUBER LATIFOLIUM, PERPETUO VITENS, *the Cork tree*, has a long, thick, hard root, that produces a middle ſized tree, with a thick trunk, and a few branches. It has a thick, light, ſpongy bark, of a yellowiſh grey colour, that cleaves of itſelf, and parts from the tree; becauſe it is puſhed forward by another bark that grows under it. The leaves are like thoſe of the ſcarlet oak, but they are larger,

larger, longer, green above, and ſometimes a little prickly; the catkins and acorns are alſo like thoſe of the ſame tree; but they are longer, blunter, and have a more diſagreeable taſte. The flower-cup is alſo bigger, and more hairy; it grows in the ſouthern parts of Europe. The inhabitants of the places where they grow cleave the trunk of this tree lengthways, to take off the bark more readily, and then they put it over burning coals, laying ſtones thereon to render it flat; after which they clean it, and ſend it to other countries; this is what we call cork, that ſerves for ſo many different uſes. When cork is burnt, and reduced to a fine powder, it is a very good remedy to eaſe the pains of the piles, mixed with the white of an egg, and the oil of ſweet almonds.

TAMARISCUS GERMANICA, *the German Tamariſk tree*, has a root as thick as a man's thigh, covered with a thick bitter bark, from whence proceed ſeveral brittle ſtems, covered with a reddiſh bark, divided into ſeveral branches, and adorned with leaves, like thoſe of common heath, of a ſea-green colour, and an aſtringent taſte. The flowers grow in ſpikes at the extremities of the branches, and conſiſt of five white, purpliſh, oval petals, or leaves, with as many ſtamina and roundiſh yellow ſummits; theſe are ſucceeded by ſmall oblong pods, which before were the piſtils, and are full of ſmall downy ſeeds. This ſhrub grows in Hungary, about Straſburg, Landaw, and Geneva, by the ſides of running waters, and moiſt ſtony places. It flowers in May and June, and does not ceaſe to bear flowers and fruit all the ſummer. They may be eaſily propagated in England, by laying down the tender ſhoots in the ſpring; but they are not of much value here becauſe they have ſtragling branches.

TAMARISCUS NARBONENSIS, *the French narrow leaved Tamariſk tree*, has a thick woody root, divided into ſeveral branches, that ſends forth ſeveral ſtems, which together form a buſh or ſhrub, and ſometimes a pretty large tree, with a trunk covered with rough grey bark. The leaves are ſmall, long, and round, like thoſe of the cypreſs tree and common heath; the flowers grow on the tops of the branches in bunches; theſe are of a whitiſh purple colour, and conſiſt of five petals or leaves, that are ſucceeded by pointed fruit, which contain ſmall downy ſeeds. It grows chiefly in hot countries, but may be propagated here like the former, though it is of no great value. It flowers generally three times a year, namely, ſpring, ſummer, and autumn; but the leaves drop off in the winter. The virtues of both theſe ſhrubs are much the ſame, and the root, bark, and leaves, are ſaid to open obſtructions of the viſcera, and to attenuate groſs humours, but they have been long out of uſe with us.

TANACETUM VULGARE LUTEUM, *common Tanſey*, has a long, woody, fibrous, perennial root, which ſends forth ſtalks to the height of two or three feet, which are round, ſtreaked, a little hairy, and pithy. The leaves are large, long, winged, dentated on the edges, and diſpoſed in pairs along a rib, terminating in a ſingle leaf; however, botaniſts generally reckon all theſe but one leaf. The flowers grow on the top of the leaves in bunches or umbels, and conſiſt of many florets, divided into ſeveral ſegments, and are of a beautiful yellow. The calyx or flower-cup is ſcaly, and contains an embryo, that turns to an oblong ſeed, which is black when ripe. It grows wild on the ſides of highways, in fields, and on the edges of ditches; but it is every where planted in gardens, and flowers in July and Auguſt. The leaves have an acrid, bitter, aromatic taſte, and are looked upon as ſtomachic, febrifuge, and ſudorific, as well as althelmintic; for both the leaves and ſeeds have always been accounted good to kill worms. Some give the juice to three or four ounces, in the cachexy, green ſickneſs, and dropſy, in which laſt caſe it has ſucceeded, when other medicines have proved ineffectual. The ſeed of tanſey may be uſed inſtead of wormſeed; but is not ſo efficacious.

THALICTRUM LUTEUM, *ſive* RUTA PRATENSIS, *meadow Rue*, has a yellowiſh, fibrous, creeping root, with ſtalks that riſe to the height of a man, which are ſtiff, furrowed, branched, hollow, and generally of a reddiſh colour. The leaves are large, of a ſhining green, and indented. The flowers grow on the tops of the branches, and conſiſt of four petals, diſpoſed in the form of a roſe, about a cluſter of green ſtamina, or chives, that ſurround a piſtil, which afterwards becomes a fruit, in which the capſula are collected into a ſmall head, that contain each an oblong, yellow, furrowed, ſmall ſeed of a bitter taſte; it has no flower-cup. It grows in meadows, and in moiſt marſhy places, by the ſides of brooks, and flowers in the ſummer. The root purges like rhubarb, for which reaſon it is called, in Germany, the rhubarb of poor people. It tinges the urine with a yellow colour, and is ſaid to have the ſame qualities in all reſpects; but the doſe muſt be three times as much. The juice of the leaves and flowers has been given, from one ounce to two, in all internal bleedings.

THLASPI, *Mithridate Muſtard*, has a thick, woody, white root, with round, hairy, ſtiff, branched ſtalks, that riſe to the height of a foot, which are furniſhed with leaves without pedicles, that are entire, and as long as the little finger, but broad at the baſe, and grow narrow by degrees to a point; they are crenated on the edges, and are of a greeniſh aſh colour, or whitiſh, with an acrid pungent taſte. The flowers are ſmall, white, and diſpoſed like thoſe of ſhepherd's purſe; they are compoſed of four leaves, placed in the form of a croſs, with ſix ſtamina, that have pointed ſummits. Theſe are ſucceeded by round or oval fruit, flatted in the ſhape of a purſe, with a leafy border, ſlit on the upper ſide, and divided into two cells by a partition, placed obliquely with regard to the valve, and furniſhed with ſmooth, roundiſh ſeeds, that have an acrid pungent taſte like muſtard. It grows in uncultivated places, expoſed to the ſun, among corn, and on the tops of houſes, and walls; it flowers in May, and the ſeed is ripe in June.

THLASPI ARVENSE, SILIQUIS LATIS, *Fiela Mithridate Muſtard, with broad pods*, has a ſmall, oblique, woody root, from whence ariſe angular, furrowed, winged ſtalks, that riſe to the height of a foot. The leaves have no pedicles, and are long, broad, ſmooth, dentated, and of a blackiſh green, with a ſmell ſomewhat like garlick. The flowers grow in ſpikes at the tops of the ſtalks, and are compoſed of four white petals, diſpoſed in the form of a croſs, that are ſucceeded by broad, flattiſh, ſmooth pods, containing roundiſh, flattiſh, reddiſh brown ſeeds, of an acrid, hot, biting taſte. It flowers in May, and the ſeed is ripe in June; it grows every where in the fields, and continues from the beginning of the ſpring to the end of autumn.

THLASPI ALLIUM REDOLENS, *Mithridate Muſtard ſmelling like Garlick*, has a ſingle white root, with a few fibres, that ſends forth ſeveral leaves, of which ſome are jagged, others are ſurrounded by ſmall teeth, and others again are without teeth or jaggs; they have generally long pedicles, and are nervous and green. From among theſe ariſe ſmall ſtalks with leaves that embrace each other alternately; the flowers grow at the tops, and are compoſed of four ſmall white petals, like thoſe of ſhepherd's purſe, and are diſpoſed in the form of a croſs. Theſe are ſucceeded by flat fruit, in the ſhape of oval purſes, which contain roundiſh flat ſeeds. All three have the ſame virtues; but the ſeeds are only made

made uſe of. They are ſaid to promote urine, and to diſſolve coagulated blood. The doſe is from one ſcruple to two; but it muſt not be given to women with child, for fear of cauſing abortion, nor yet to patients of hot conſtitutions. The ſeed of the firſt is an ingredient in mithridate and venice treacle.

THYMUS CAPITATUS DIASCORIDIS, the *true Thyme of the ancients*, has a hard, woody root, furniſhed with fibres, that ſends forth a ſmall ſhrub to the height of a foot, which is divided into ſlender, woody, white branches, with leaves placed oppoſite to each other, that are ſmall, narrow, whitiſh, and fall off in the winter. The flowers grow in heads at the top of the branches, which are ſmall, purpliſh, labiated, and conſiſt of a ſingle petal. There are ſtamina, with ſlender ſummits, and the piſtil is attended by four embryoes, which become ſo many ſeeds, incloſed in a huſk, which before was the cup of the flower. It is common in Candia, Greece, Spain, and Sicily, and grows on mountainous places, expoſed to the ſun. With us they are cultivated in gardens, and were formerly ſet in pots and tubs; but of late they have been found to endure the winter.

Beſides this there are common broad leaved thyme, narrow leaved thyme, and broad leaved ſtriped thyme, which have all the ſame virtues, and may be uſed indifferently in medicine. They are ſaid to ſtrengthen the brain, and to attenuate and rarify clammy humours. They help digeſtion, and may be of ſome ſervice in ſhortneſs of breath; but they are chiefly uſed in the kitchen as a pot-herb.

All theſe plants may be propagated, either by ſowing the ſeeds or parting the roots; and the proper ſeaſon for both is at the latter end of March.

THYSSELINUM, *Milky Parſley*, has a long, reddiſh, brown root, full of a milky fluid, that has a hot, ſharp, ſtrong, diſagreeable taſte. It ſends forth a ſtalk to the height of four feet, which is hollow, channelled, and branched. The leaves are ferulaceous, that is reſembling that of the ferula, and have a milky juice like the root. On the tops of the branches there are flowers in umbels, conſiſting of five yellowiſh white petals, in the form of a roſe, with as many capillary ſtamina with roundiſh ſummits. Theſe are ſucceeded by oval, large, flattiſh ſeeds, placed by pairs, and radiated on the back. It grows in moiſt, marſhy places, on the ſides of ponds and brooks, and of ditches full of water. It flowers in June and July, and the ſeeds are ripe in the beginning of Auguſt. The root has been uſed in decoction, to promote urine, but it is not very ſafe, on account of its acridity. Boerhaave affirms, that the milk has the ſame purging quality of ſcammony, and may be uſed inſtead of it.

TILIA, the *Lime*, or *Linden tree*, has a deep ſpreading root, that ſends forth a very large trunk, ſo full of branches, that it is very proper for ſhady walks. It is covered with a ſmooth aſh-coloured bark, which is yellowiſh or whitiſh within. It is ſo tough and flexible, that in ſome places, where better materials are ſcarce, they make cords and cables therewith. The leaves are broad, roundiſh, and terminate in a point, and are a little downy on both ſides, as well as dentated on the edges; the flowers conſiſt of five whitiſh petals, which are placed orbicularly, and expand in the form of a roſe. There is a long narrow leaf growing to the foot ſtalk of every cluſter of flowers, each of which has a great number of ſtamina, with yellow ſummits, and are ſuſtained by a cup cut into five white thick parts. Theſe are ſucceeded by a pod of the ſize of a large pea, which are almoſt round or oval, as well as woody, angular, hairy, and contains one or two roundiſh blackiſh ſeeds, of a ſweetiſh taſte. Beſides this, there are the ſmall leaved lime tree, the red twigged lime tree, the Carolina lime tree, the ſtriped leaved lime tree, and the American black lime tree.

The three firſt ſorts are common in England, and are cultivated in moſt nurſeries; but the *Carolina* and *American* are not yet very common. They are all eaſily propagated by layers, which in one year will take good root, and then may be taken off and planted in a nurſery, at four feet diſtant, row from row, and two feet aſunder in the rows. The beſt time to lay them down is about Michaelmas, when the leaves begin to fall, that they may take root before the froſt comes on; it is likewiſe much the beſt to remove them in autumn. They may remain here five years, and the large ſide ſhoots muſt be pruned off, to cauſe them to advance in height, but the ſmall twigs muſt not be cut off from the ſtems, becauſe they are neceſſary to retain the ſap for the augmentation of their trunks. If the ſoil be a fat loam, they will in that time be large enough to plant where they are to remain. The timber of the lime tree is uſed by carvers, becauſe it is a light ſoft wood; as alſo by architects for framing models of their buildings; not to mention the turners, who make bowls and diſhes therewith.

With regard to their medicinal virtues, the flowers are ſaid to be good in all diſorders of the head, and may be drank like tea with ſugar. Some make a conſerve of them for the ſame purpoſe, and the doſe is from half an ounce to an ounce. Some affirm them to be good in the ſtone and gravel, and to diſſolve coagulated blood. The berries are aſtringent, and good againſt all ſorts of hemorrhages and looſeneſſes; the doſe is a drachm in powder.

TINCTORIUS FLOS, *or* LUTEOLA, *Dyer's Weed, or yellow Weed*, by ſome called *Weld* or *Would*, has a root generally as thick as a man's little finger, which is ſingle, woody, white, and has a very few fibres. The leaves are oblong, narrow, ſmooth, and not dentated, though ſometimes they are a little curled. Among theſe there riſe ſtalks to the height of three feet, which are round, hard, ſmooth, greeniſh, branched, and furniſhed with leaves that are leſs than thoſe below; and on the tops there are flowers, compoſed of three uneqal petals, of a beautiful yellowiſh green colour. Theſe are ſucceeded by almoſt round capſula, terminated by three points, which contain ſeveral roundiſh, ſmall, blackiſh ſeeds. It is very common in England, and grows upon dry banks, and on the tops of walls and buildings, almoſt every where. It is of great uſe among the dyers, and will grow on the pooreſt ſort of land, provided it be dry. The ſeeds ſhould be ſown in the middle of Auguſt, ſoon after they are ripe; they will come up the firſt moiſt weather, and will grow very ſtrong the ſame autumn, provided they are ſown by themſelves. When they are pretty ſtrong, they ſhould be howed like turneps, to deſtroy the weeds, and to thin them where too thick. The ſeed muſt not be too ripe when gathered, for then it will fall out; nor yet muſt the ſtalk be under ripe, for then it will be good for nothing. It muſt be bound in handfuls, and then ſet to dry like flax, taking care not to ſhake out the ſeed; which is uſually ſold for ten ſhillings a buſhel, and a gallon will ſow an acre. It is uſed for dying bright, yellow, and lemon colours. A great deal of this is ſown in Kent, eſpecially about Canterbury; and they cultivate it in Languedoc and Normandy, in France, where they boil it in water with alum, and then it will colour white wool yellow, and blue ſtuffs green. It is ſaid to be an

an opening medicine, and to be good againſt the jaundice and cachexy; but it is ſeldom or never uſed with us.

TITHYMALUS, *Spurge*, is of three kinds, namely, *German Spurge*, *Garden Spurge*, and *narrow leaved Wood Spurge*.

German SPURGE has a thick, white, woody, creeping root, which ſends forth ſeveral ſtalks, to the height of two or three feet, about as thick as a man's little finger; theſe are reddiſh, branched, and beſet with leaves alternately placed, and theſe are ſmooth, oblong, green, and periſh in the winter with the ſtalks. The flowers grow on the tops of the branches, and are diſpoſed in umbels. They conſiſt of one ſingle leaf or petal; in the ſhape of a ſlipper, whoſe pointal afterward becomes a tricapſular fruit, divided into three cells, each of which contains a roundiſh ſeed full of a white ſubſtance. It grows upon the ſandy banks of rivers, and other marſhy places; it is common in Germany, on the banks of the Rhine, from whence it has its name. It is ſometimes in gardens, and flowers in May and June. It is cultivated full of an acrid milky juice, like other plants of this kind.

Garden SPURGE has a ſingle root, with a few capillary fibres, and ſends forth a ſtalk to the height of two feet, as thick as a man's thumb, which is round, ſolid, reddiſh, branched at the top, and furniſhed with many leaves three inches long, in the ſhape of thoſe of willow; they are of a bluiſh green, ſmooth, and ſoft to the touch. The flowers grow on the tops of the branches, and are each compoſed of four thick petals, with ſeveral ſlender ſtamina, and roundiſh ſummits; they are encompaſſed with two pointed yellowiſh leaves, which ſeem to be in the room of a cup. They are ſucceeded by fruits, that are larger than thoſe of the other plants of this kind, which have three corners, divided into three cells, with a ſeed in each as big as a pepper-corn. The whole plant is full of a milky juice, and is almoſt every where cultivated in gardens. It flowers in July, and the ſeed is ripe in Auguſt and September. Beggars make uſe of this milk very frequently to diſfigure the ſkin, in order to move compaſſion. If the leaves or fruit of this plant are thrown into ponds, it makes the fiſh riſe to the ſurface of the water, where they lie as if they were dead; but they may be recovered ſpeedily by changing the water.

TORMENTILLA SYLVESTRIS, *wild Tormentil, or Septfoil*, has a root about as thick as a man's finger, which is rough, unequal, ſometimes ſtrait, and ſometimes crooked, of a dark colour without, and reddiſh within; it is a kind of a tubercle, and is furniſhed with a few fibres. The ſtalks are ſlender, weak, hairy, reddiſh, and about a foot long; they lie on the ground, and are ſurrounded with leaves by intervals, like thoſe of ſix leaved graſs; they are hairy, and there are commonly ſeven leaves at the top of the foot ſtalk. The flowers conſiſt of four yellow petals, placed like a roſe, ſupported by a calyx or cup, in the form of a baſon, divided into eight parts, of which four are large, and four are ſmall; they are placed alternately, with ſixteen ſtamina in the middle. Theſe are ſucceeded by a globular fruit, which contains many ſeeds that are ſmall and oblong. It grows almoſt every where, in dry paſtures and commons, in moſt parts of England; it flowers in May, June, and July, and the root is principally uſed in medicine; but the Tormentil of the Alps is much more valuable, on account of its ſuperior virtues. The root has a ſtyptic very bitter taſte, and is accounted good to ſtop looſeneſſes, hæmorrhages, and the like. The doſe in decoction is from half an ounce to an ounce, and in powder from half a drachm to a drachm.

TRIFOLIUM PRATENSE PURPUREUM, *common meadow Trefoil, with a purple flower*, by many called *Honey-ſuckle*, has a root as thick as a man's little finger, which is long, round, woody, creeping, and fibrous. The ſtalks riſe to the height of a foot, or a foot and a half, and are ſlender, channeled, and ſometimes a little hairy. The leaves are partly round, and partly oblong, and there are three together on the ſame pedicle, marked on the middle with a ſpot, in the ſhape of a heart, which is ſometimes white, and ſometimes dark. The flowers grow on the tops of the ſtalks, and have ſome reſemblance to the papilionaceous kind; are diſpoſed in a head, or ſhort thick ſpike, of a purpliſh colour, and have a juice at the bottom, as ſweet as honey. They are ſucceeded by ſmall round capſula, each of which is incloſed in a calyx, and terminated by a long pedicle, containing a ſeed, in the ſhape of a kidney. It grows almoſt every where in meadows and paſture grounds, flowering in April, May, and June. The flowers are greatly ſought after by bees, and the whole herb is excellent for feeding cattle.

TRIFOLIUM ARVENSE HUMILE SPICATUM, *Hare's-foot Trefoil*, is the lagopus of the ſhops, and has a ſlender, woody, fibrous, crooked, white, annual root. It has ſeveral ſtalks, about ſix inches high, which are branched, ſtrait, and covered with a whitiſh down. Three leaves are placed together upon one pedicle, which are ſmaller than common trefoil, and are downy and whitiſh, eſpecially upon the back. The flowers are ſmall, whitiſh, papilionaceous, and fixed on hairy ſoft ſpikes, which reſemble the feet of a hare; the colour is aſh, inclining to purple. Theſe are ſucceeded by capſulæ, incloſed in a calyx, each of which contain a reddiſh ſeed like a ſmall kidney. It grows every where in fields among corn, and flowers towards the latter end of ſummer, continuing till October. Moſt phyſicians affirm it is good to ſtop looſeneſſes of every kind, if the decoction be uſed as common drink. If the ſeed happens to be mixed with wheat, it turns the bread of a reddiſh colour, which had like to have cauſed an inſurrection at Paris; for the people affirmed the bakers mixed blood with their flower.

TRIFOLIUM BITUMINOSUM, *Trefoil, ſmelling of Bitumen*, has a hard, woody, fibrous root, which ſends forth a ſort of a ſhrub, about two feet high, and is divided into ſeveral ſtiff channeled branches, which are ſometimes whitiſh, and ſometimes blackiſh. The leaves grow by three's on the ſame pedicle, which, when they firſt appear, are round, but grow longer afterwards, and terminate in a ſharp point; they are whitiſh, downy, clammy to the touch, and have the ſmell of bitumen. The flowers grow on the tops of the ſtems and branches, are diſpoſed like an oblong head, and are papilionaceous, and of a violet purple colour; they are ſuſtained by an oblong, channeled, hairy calyx. Theſe are ſucceeded by a capſula incloſed by the calyx, which contains a rough, pointed, blackiſh ſeed, of the ſame ſmell with the reſt of the plant. It grows in Candia, Sicily, Languedoc, and the ſouthern parts of France; on ſtony hills near the ſea, and is planted here in ſome gardens for the ſake of variety, and kept in pots. It flowers in June, July, and Auguſt, and will ſtand the winter, if it is not too ſevere. The juice of this plant has been accounted a ſecret againſt a cancer, and has been given from one ſpoonful to two, for that purpoſe.

TRIFOLIUM HÆMORRHOIDALE, *pile Trefoil*, has a long, hard, woody root, with ſeveral ſtalks, which riſe to the height of two or three feet, are ſlender, round, hairy, woody, branched, and make a kind of a ſhrub, furniſhed with downy, whitiſh, and roundiſh leaves, which grow by three's on the ſame pedicle, and have two appendages at the baſe. The flowers grow at the extremities of the ſtems and branches, and are papilionaceous, whitiſh, and ſup-

ported by a hairy calyx. They are ſucceeded by ſhort thickiſh pods, of a reddiſh brown colour, that contain a round ſmall ſeed, yellowiſh within. It grows in the ſouthern parts of France, and flowers in the ſummer. It has been counted an excellent remedy for the piles; and ſome affirm, a drachm or two of theſe leaves, given in powder, has been of great ſervice in that diſorder.

Bird's-foot Trefoil is the *Trifolium Corniculatum* of the ſhops, and has a woody, long, black root, divided into ſeveral branches, and furniſhed with fibres. The ſtalks are ſlender, branched, and lie upon the earth; and the leaves are placed as in other trefoils, only there are two ſmall flat leaves that grow underneath them, which are ſometimes ſmooth, and ſometimes a little hairy. The flowers are papilionaceous, grow in umbels, and are ſometimes yellow, and ſometimes greeniſh, like thoſe of broom; the calyx is dentated, and in the ſhape of a horn; the flowers are ſucceeded by capſulæ or pods, in the form of a cylinder, which contain ſeveral roundiſh ſeeds, in the ſhape of kidneys. It grows almoſt every where, and flowers in ſummer; it is exceeding good for cattle, but is of little uſe in medicine.

TULIPA, *Tulip*, is a lily flower, generally compoſed of ſix petals or leaves, in the ſhape of a pitcher: the pointal, which ariſes from the middle of the flower, is ſurrounded with a ſtamina, which afterwards becomes an oblong fruit, that opens into three parts, and is divided into three cells, full of plain ſeeds, which reſt one upon another, in a double row. The root is coated, bulbous, and there are fibres on the lower part. There are ſeveral kinds of tulips, which there is no occaſion to enumerate, becauſe they may all be ſeen in one good garden; but the beſt have a tall ſtrong ſtem. The flower conſiſts of ſix leaves, three within and three without, and the former ſhould be longer than the latter. Their bottoms ſhould be proportioned to the top, and their upper parts ſhould be rounded off, and not terminate in a point. Theſe leaves, when open, ſhould neither turn inward nor bend outward, but rather ſtand erect; and the flower ſhould be of a middling ſize, neither too large nor too ſmall; the ſtripes ſhould be ſmall and regular, ariſing from the bottom of the flower, and the chives ſhould not be yellow, but of a brown colour. They generally divide tulips into three claſſes, namely, the early flowers, the middling flowers, and the late flowers; but they are beſt divided into early and late, of which the laſt are the beſt.

TUSSILAGO, *Colt's-foot*, has a long, ſlender, whitiſh, tender root, with ſtalks that riſe to the height of a foot, which are hollow within, downy, reddiſh, and covered with leaves without pedicles. Theſe are long pointed, placed alternately, and at the top of the ſtalk there is a beautiful, round, radiated flower, reſembling that of dandelion, with capillary ſtamina, that have cylindrick ſummits. Theſe are ſucceeded by ſeveral oblong, flattiſh, downy ſeeds. After the flowers, the other leaves appear, which are very large, a little angular, almoſt round, green above, and whitiſh and downy below. It grows in moiſt places, and on the borders of rivers, brooks, ponds, and ditches. It flowers about the end of February and beginning of March. Colt's-foot is an excellent medicine to abate the ſharpneſs of the humours, to cleanſe ulcers of the breaſt, and to facilitate expectoration. There are a great many that are troubled with the aſthma, who cut the leaves ſmall, and mix it with tobacco for ſmoaking; and affirm they find great benefit thereby. Both the flowers and leaves are uſed in pectoral decoctions; and Dr. Hillary, phyſician to the king of Pruſſia, cured a great many conſumptive children, by feeding them with colt's-foot leaves, boiled and buttered.

VALERIANA HORTENSIS, *Garden Valerian*, has a wrinkled root, of the thickneſs of a man's thumb, placed near the ſurface of the ground, and furniſhed with thick fibres, of a yellowiſh or brown colour, that croſs each other. The ſtalks are about three feet high, and are ſlender, round, ſmooth, hollow, branched, and furniſhed with leaves, placed oppoſite to each other by pairs. Some are ſmooth and and entire, while others are cut deeply on each ſide, generally terminate in a roundiſh point. The flowers grow in umbels on the tops of the ſtalks and branches, and are of a purpliſh white colour, with a ſweet ſmell, not unlike that of jeſſamine. Each of theſe is a ſort of tube, cut into five parts, with a few ſtamina that have roundiſh ſummits. They are ſucceeded by flattiſh, oblong, tufted ſeeds. It is cultivated in gardens, and propagated by parting the roots, either in the ſpring or autumn; they ſhould be planted on beds of freſh, dry earth, about eight or ten inches aſunder, and ſhould be watered till they have taken root. The wild ſort is now univerſally preferred for medicinal uſes, and therefore no more need be ſaid of this.

VALERIANA SYLVESTRIS MAJOR, *Great wild Valerian*, has a fibrous, whitiſh, ſtreaked root, with a very ſtrong ſmell when it is dry, and an aromatic taſte; the ſtalks riſe to the height of a man, and are ſtrait, ſlender, hollow, channeled, knotty, and a little hairy. The leaves reſemble thoſe of garden Valerian, but are more divided, greener, and dentated on the edges; they are a little hairy or downy underneath, and have ſeveral large veins. The flowers grow on the tops of the ſtalks and branches in umbels, and are of a purpliſh white colour, like thoſe of the former; the ſeeds are tufted or downy, for which reaſon they are carried about with the wind. It generally grows on dry chalky land, and ſhady places, in divers parts of England. It flowers in May and June, and the ſeed is ripe in July. The root is bitter, ſtyptick, and has a diſagreeable aromatic ſmell; it is much cried up againſt the epilepſy, and is ſudorifick as well as hyſterick; it is accounted good for the aſthma, and all kinds of convulſive diſorders. It may be taken in decoction, from two drachms to half an ounce, and, in ſubſtance, from one drachm to two. It ſhould be taken up in the ſpring, before the branches appear, and dried in the ſhade. Several phyſicians affirm, they have cured a great number of epileptick patients with the powder of the root of wild Valerian, given to a drachm in a ſudorifick decoction, and continued for ſome time.

VALERIANELLA, *Corn Sallad, or Lambs Lettuce*, has a ſlender, fibrous, or white annual root, and a ſtalk about ſix inches high, which is weak, round, crooked, channeled, hollowed, knotted, branched, and commonly lies upon the ground. It is generally ſubdivided into two at each knot, and theſe laſt into ſeveral branches. The leaves are oblong, pretty thick, ſoft, tender, and placed by pairs, oppoſite to each other; the colour is a pale green; ſome of them are entire, and others crenated, without pedicles. The flowers grow on the tops of the branches, are ſmall, of a purpliſh white colour, and placed in umbels; they each conſiſt of one leaf or petal, cut into five parts, and are ſucceeded by roundiſh, flattiſh, wrinkled, whitiſh ſeeds, which fall off before they come to maturity. It grows almoſt every where, among corn, and is cultivated in gardens, where it is ſown in September for winter uſe. It is uſually mixed with ſallads, and will continue till April. It is ſaid to have the virtue of lettuce, and to be good in the rheumatiſm, ſcurvy, and gout; but it is now never uſed for theſe purpoſes. Young lambs are ſaid to be fond of it.

VERATRUM, *White Hellebore*, is of two ſorts, one of which has a greeniſh flower, and the other a dark red flower. The former of theſe has been mentioned

mentioned before, in the firſt chapter; but as nothing was ſaid of the cultivation, we ſhall take notice of it here, eſpecially as it is accounted a pretty ornament for gardens. They ſhould be ſet on the open borders of a pleaſure garden, and from each head of the root, a flower ſtem will be produced, about three feet high, with a ſpike of flowers about a foot long at the top; the red flowers are generally preferred, on account of their colour. They may be propagated by parting the roots, either in autumn or the middle of March, juſt before they begin to ſhoot; and ſhould be planted in a light, rich, freſh ſoil, in which they will thrive exceeding well. They ſhould not be removed above once in three or four years, by which time they will be very ſtrong, and afford many heads to be taken off.

VERBASCUM, *Great white Mullein*, has a ſingle, oblong, thickiſh, woody, white root, with a few fibres; and the ſtalk, which riſes to the height of four or five feet, is thick, round, hard, woody, and crooked, with a ſort of wool or cotton; the leaves are long, broad, woody, white on both ſides, partly lying upon the ground, and partly fixed to the ſtalk alternately, with appendages, which ſeem to render the ſtalk winged. The flower conſiſts of one leaf, in a circular form, which is cut into five parts, and joined to each other by a tuft; it is yellow, and ſurrounds the greateſt part of the tops of the ſtalk and branches. The flowers are ſucceeded by oval ſhells, terminating in a point, divided into two cells, which contain a great number of ſmall, angular, blackiſh ſeeds. It grows in ſandy places, by the ſide of highways, and ſometimes on walls; it flowers in June, July and Auguſt.

VERBASCUM FŒMINA FLORE LUTEO MAGNO, *Female Mullein*, with a large yellow flower, has a long, thick, woody, ſingle, white root, like the former, and the ſtalk, which riſes to the height of four or five feet, is thick, round, hard, downy, and a little branched. The leaves are round, long, ſoft, downy, and white; and the flowers are like the former, having five ſtamina in the middle, with purple ſummits. Theſe are ſucceeded by almoſt round capſula, pointed at the end, and divided into two cells, which contain ſeveral angular browniſh ſeeds. This plant grows in the ſame places as the former, and flowers the ſecond year after it is come up towards the end of ſummer, and in Auguſt. They both may be cultivated in gardens, by ſowing the ſeeds in Auguſt, on a bed of light earth, and in an open ſituation; but it is ſeldom done except in botanick gardens for variety. They both have the ſame virtues, and the leaves and flowers are in uſe. The decoction has been given in diſorders of the throat, in violent coughs, in the bloody-flux, the gripes, and a teneſmus. The flowers are ſaid to be pectoral, proper to abate the acrimony of the humours, to cure itching of the ſkin, and the outward and inward piles.

VERONICA MAS, *common male Speedwell*, or *Fuellin*, has a ſlender, fibrous, ſpreading root, which ſends forth ſeveral ſlender, long, round, knotty, hairy ſtalks, generally lying on the ſurface of the ground. The leaves grow by pairs oppoſite to each other, and are like thoſe of a plumb-tree; they are downy, dentated on the edges, and have a bitter acrid taſte. The flowers are diſpoſed in ſpikes, like thoſe of germander, and are ſmall and bluiſh, and ſometimes white, with two ſtamina of the ſame colour, with oblong ſummits. The flower conſiſts of one leaf, which is divided into four parts, and is ſucceeded by fruit in the ſhape of a heart, placed in two cells, which contain ſeveral round blackiſh ſeeds. It grows wild in the woods, and other ſhady places in divers parts of England. There are ſome other ſpecies of this plant; but this is the only one uſed in medicine, and is ſaid to have ſo many virtues, that an entire treatiſe would ſcarce contain them; beſides which ſome call it the European tea. In general, it is ſudorifick, vulnerary, detergent, diuretick, and proper to cleanſe the lungs. Hence it is good in a dry cough, the aſthma, ulcers of the lungs, and ſpitting of blood. It opens obſtructions of the bowels, promotes the circulation of the blood and humours, and is excellent in the gravel. It is beſt uſed in the manner of tea, and is very good in ſleepy diſorders.

VIOLA MARTIA PURPUREA FLORE SIMPLICE ODORO, *common purple Violet, with a ſweet ſcented flower*, has a fibrous, thick, or tufted root, that ſends forth many almoſt round leaves, as large as mallows, dentated on the edges, green, and having long pedicles. From among theſe there ariſe ſlender pedicles, which have each a ſmall flower, of a purpliſh blue colour, with a very agreeable ſmell. It is compoſed of five ſmall leaves, with as many ſtamina, that have blunt ſummits, and a kind of a ſpur; the calyx or flower-cup is divided at the baſe into five parts. When the flower is gone, there remains a capſula, or oval ſhell, which, when ripe, opens into three parts, in which are almoſt round ſeeds, connected to the ſides of the ſhell, which are leſs than thoſe of coriander, and of a whitiſh colour. It grows in ſhady places, in ditches, and the ſides of hedges, as well as againſt walls, where they readily multiply with their long creeping filaments, which take root here and there. They flower in March, and do not loſe their leaves, nor the verdure, during the winter. Beſides this, there are no leſs than twenty-eight ſorts, and about eight of them ſerve to make agreeable varieties in gardens and wilderneſſes, by placing them under hedges, and other ſhady places. They may be eaſily propagated, by parting the roots; the beſt time for which is about Michaelmas. The leaves and flowers are uſed in medicine, and ſometimes the roots, by infuſion, three ounces of which will purge upwards and downwards. The flowers are a little purgative, and we are aſſured, that a drachm of their powder, taken in water-gruel, is a good purge; but they are generally uſed to make a ſyrup of, which, when well managed, is of a very fine colour.

VISCUM, *Miſletoe*, has a green root, which is a little woody in the middle, and ſends forth a ſhrub about two feet high. The ſtalks, which are ſometimes as thick as one's little finger, are woody, heavy, compact, knotted, and of a browniſh-green. There are a great number of flexible woody branches. The leaves are placed by pairs oppoſite to each other, and are oblong, thick, fleſhy, hard, and pretty like thoſe of the great box, but longer, and roundiſh at the end. The flower conſiſts of one leaf, in the form of a baſon, and is generally divided into four parts, and beſet with tubercles or warts. The ovary of the female flowers is placed in a remote part of the plant from the male flowers, and conſiſt of four ſhorter leaves; theſe turn to a round berry, full of a clammy ſubſtance, in which is a plain ſeed, in the ſhape of a heart. It grows almoſt on all kinds of trees, according to ſome authors, and is always produced from ſeeds, which will not grow in the ground like other plants. It is ſuppoſed that the miſletoe-bird or thruſh, which feeds upon the berries of this plant in winter, when they are ripe, often carries the ſeeds from tree to tree; for the clammy part of the berry, which immediately ſurrounds the ſeed, ſometimes ſticks faſt to the outer part of the bill of the bird, which, to diſengage himſelf from, he ſtrikes it againſt the branches of a neighbouring tree; and by that means leaves the ſeeds, ſticking on the bark, which will grow the ſucceeding winter. It may be propagated by art in the ſame manner. The trees it is found commonly upon, are the apple and aſh; and it is ſometimes, though but ſeldom, found on the oak;

oak; which perhaps is the reaſon why that is cried up more than others; but without any ſufficient reaſon. Miſletoe is looked upon as a great anti-epileptick, and the doſe of it in powder is from one drachm to two. Simon Pauli cries it up againſt the pleuriſy, and orders one drachm of the powder, in four ounces of barley-water. The berries purge upwards and downwards, with great violence, and therefore are not proper to be given inwardly.

VITIS, *the Vine*, has a long woody root, which ſends forth a climbing tree, that has claſpers at the joints, by which it faſtens itſelf to whatever plant ſtands near it. The leaves are large, broad, and almoſt round, green, ſhining, cut, a little rough to the touch, and of an aſtringent taſte. The flowers are ſmall, and are each compoſed of five petals or leaves, diſpoſed in a circular order. They are of a yellowiſh colour, with as many upright ſtamina. When the flowers are fallen, they are ſucceeded by round or oval berries, lying cloſe to each other in cluſters, which are green at firſt, and, as they ripen, become white, red, or black; they are alſo full of a pleaſant juice. This tree is cultivated in moſt hot and temperate countries, and riſes to a great height in a ſhort time, if it be left to itſelf, and not cut. In ſome countries it will riſe to the top of the higheſt trees, and have a ſtem of a prodigious ſize. It flowers in the ſummer, and the grapes are ripe in autumn.

All ſorts of vines are propagated either from layers or cuttings, the former of which is greatly practiſed in England, but the latter is preferred by Mr. Millar; and he lays down excellent rules for their cultivation, which we have not room to take notice of here.

The buds of the vine, as well as the leaves, are aſtringent, and were uſed by the antients to cure looſeneſſes; at preſent, there are ſome in France that give the powder of the green leaves, dried in the ſhade, to a drachm, for the ſame purpoſes. The uſe of the grapes is univerſally known, they being proper either for eating, or making of wine. When they are green, they produce the liquor which is properly called verjuice; and, in this ſtate, it is a little aſtringent, ſerves to abate the heat of the ſtomach, and to ſtop a bilious looſeneſs, as well as to recover the appetite. It is made uſe of in France in the ſame manner as our common verjuice made with crabs. Of the juice of ripe grapes they make a ſapa or rob, by evaporating it over the fire, till a third part remains. This is a little aſtringent and ſtyptick, which are made uſe of in France to prepare quinces with; and then it is ſaid to be excellent to ſtop looſeneſſes, and to ſtrengthen the ſtomach. As for wines, they vary greatly, with regard to their colour, ſmell, taſte, and conſiſtence; all which are different, according to the different kinds of grapes of which the wine is made. Good generous wine, of any ſort, is an excellent cordial, if properly uſed, and of late has been found to be of great ſervice in all ſlow nervous fevers; for they will recover the patient, when other things fail. However, there are ſome wines that are too aſtringent for common uſe, and conſequently produce coſtiveneſs; for which reaſon they muſt be unwholeſome, unleſs drank in ſmall quantities; however, they are proper enough for thoſe whoſe ſtomachs are relaxed. Meagre acid wines agree with thoſe of a bilious conſtitution, to reſtrain the efferveſcence of the blood, but with none elſe. Strong ſpirituous wines are moſt proper to raiſe the ſpirits, and to reſtore the exhauſted ſtrength, eſpecially when they are not drank too commonly.

VITIS IDÆA, FOLIIS OBLONGIS CRENATIS, *common black Wortle, or Bilberry*, has a ſlender, woody, hard root, often creeping under the ground, which ſends forth a ſmall ſhrub, about a foot in height, with ſeveral ſlender branches, that are angular, flexible, and difficult to break, as well as covered with a green bark. The leaves are oblong, and about the ſize of thoſe of box, but not ſo thick; they are green, ſmooth, ſlightly dentated on the edges, and have an aſtringent taſte. The flowers conſiſt of a ſingle leaf, in the ſhape of a pitcher, and are connected to ſhort pedicles, of a reddiſh white. There is a ſmall laſting flower-cup, in which is the germen, attended by eight ſtamina, with forked ſummits. The germen afterwards becomes a ſoft, globular, umbilicated berry, of the ſize of juniper berries, and of a deep blue, or blackiſh colour. It grows very common on large wild heaths, in many parts of England; but it is never cultivated in gardens, becauſe it will not thrive therein. In thoſe parts where they are common, the poor people gather them, and bring them to markets to ſell, or cry them about the ſtreets. It is common to eat them with milk or cream. Some take the juice of theſe berries, and boil them to the conſiſtence of a rob, with ſugar, which is ſaid to be good againſt a common looſeneſs, and to temperate the efferveſcence of the bile. Several vintners in France make uſe of theſe berries, to colour their white wines red, as well as to increaſe the quantity thereof; and it were to be wiſhed, that nothing worſe was any where uſed to adulterate this liquor. Some likewiſe make uſe of the juice to colour linen, as well as paper, blue.

ULMARIA, *Meadow-Sweet*, has a pretty thick root, as long as one's finger, which is blackiſh without, of a reddiſh brown within, and has a few reddiſh fibres; it ſends forth a ſtalk, to the height of three feet, which is ſtrait, angular, ſmooth, reddiſh, firm, hollow, and branched. The leaves are placed alternately, and are compoſed of ſeveral other oblong leaves, not much unlike thoſe of drop-wort. They are dentated on the edges, wrinkled, and green above, but whitiſh below. The flowers are ſmall, and grow in bunches on the tops of the ſtalks and branches; they each conſiſt of ſeveral petals or leaves, of a whitiſh colour, in the form of a roſe, and have an agreeable ſmell. Theſe are ſucceeded by a fruit, compoſed of many little membranaceous crooked huſks, gathered into a ſort of a head, each of which contains a ſmall ſeed. It grows wild in moiſt meadows in moſt parts of England, and the flowers in the middle of June make a fine appearance among the graſs. The ſeeds are ripe in autumn. This plant is ſaid to be ſudorific, cordial, and vulnerary, and ſome recommend its decoction in malignant fevers; others greatly praiſe it againſt fluxes, and internal hurts, but it is not to be depended upon on theſe accounts. A drachm of the extract of the root is ſudorific, if it be taken for two or three days together. The tender leaves and flowers of this plant, put into wine, mead or beer, give them an agreeable taſte and ſmell, which ſome are very fond of.

ULMUS, *the Elm tree*, has a thick, hard, woody root, which ſpreads greatly in the ground, and ſends forth a large branched tree, with a thick trunk, covered with a chapped bark, which is rough, and of a reddiſh aſh colour without, but whitiſh within. The wood is ſtrong, hard, inclining to yellow, with a reddiſh caſt, and the leaves are broad, wrinkled, veinous, oblong, dentated on the edges, terminating in a point, of a pretty deep green above, with ſhort pedicles, and croſſed longways by a nerve, which does not appear ſo much on one ſide as the other. The flower, which appears before the leaves at the top of the branches, conſiſts of a ſingle leaf, ſhaped like a bell, furniſhed with ſeveral dark coloured ſtamina, and from the bottom ariſes the pointal, which afterwards turns to a membranaceous and leafy fruit, almoſt in the ſhape of a heart. In the middle of which is placed a ſeed-veſſel, in the ſhape of a pear, containing

containing a ſingle ſeed of the ſame ſhape. This tree grows in plenty all over England, and is propagated by ſeeds; and ſuckers that riſe from the roots of old trees in ſuch plenty, as hardly to be rooted out, particularly in hedge-rows, which, when left undiſturbed, will ſend forth young plants every year; from whence the people who ſupply the nurſerymen gather them. It flowers in March and April, and the ſeeds are ripe in May.

Beſides the common Elm, there are the witch hazel, or broad leaved Elm; the ſmall leaved or Engliſh Elm, the ſmooth leaved or witch Elm, the Dutch Elm, the Engliſh Elm with beautiful ſtriped leaves, the yellow leaved Elm, the Dutch Elm with ſtriped leaves, the ſmooth narrow leaved Elm, the white barked Elm, and the French Elm. The three firſt, as well as the former Elm, are common in England, and ſo is the fourth, which is as hardy as the former. Thoſe ſorts with ſtriped leaves are preſerved by the curious, who collect variegated plants. The ſmooth narrow leaved Elm is common in ſome parts of Hertfordſhire, and Cambridgeſhire, and is a very handſome upright tree, which retains its leaves late in the autumn. They may be all propagated by layers or ſuckers taken from the roots of old trees; but the method by layers is beſt, becauſe they come on faſter than the others. The beſt ſoil for ſuch a nurſery is a freſh hazel loam, neither too light nor too dry, nor yet too moiſt and heavy.

With regard to the medicinal virtues, we are aſſured in the German Ephemerides of 1727, that ſeveral perſons, afflicted with the dropſy aſcites, have been cured by the decoction of Elm-bark, uſed as common drink for five or ſix weeks. There are ſometimes on Elm leaves a ſort of bladders, that ſwell to the bigneſs of a man's fiſt, which contain a liquor, in which are greeniſh inſects. This muſt be ſtrained through a cloth, and then ſeveral affirm it will be good for all recent wounds and bruiſes. Ray tells us, that the decoction of Elm-bark, reduced to the conſiſtence of a ſyrup, and a third part of brandy added, is good to eaſe the hyp-gout, if uſed as a liniment.

UMBILICUS VENERIS, *Navel-wort*, has a tuberoſe, fleſhy, white root, furniſhed below with ſmall fibres, which ſend forth round thick leaves, full of juice, that are tender, hollowed like a baſon, and fixed to long pedicles, of a ſea-green colour; from the middle of theſe there ariſes a ſlender ſtalk, about half a foot high, which is divided into ſeveral branches, covered with ſmall flowers, conſiſting of a ſingle leaf, expanded in a circular order, and cut into ſeveral ſegments; the colour is white, or a little inclining to purple, with ten ſtamina, and ſtrait ſummits. Theſe are ſucceeded by a fruit, compoſed of four hollow, umbilicated capſula, ſomewhat reſembling a baſket, in the middle of which is contained one ſeed, that is almoſt flat. This plant grows naturally among rocks, and on old walls, in ſtony hot countries, and flowers in April and May, at which time the leaves decay. It begins to appear towards the end of autumn, and keeps its leaves all the winter.

UMBILICUS VENERIS ALTER, *creeping Navel-wort*, has a long creeping root; but the leaves are much the ſame as thoſe of the former, only they are greater, thicker, open towards the pedicle, crenated on the edges, and from among them there ariſes a round, firm, reddiſh ſtalk, furniſhed with ſmaller leaves, divided into ſeveral branches, loaded with yellow flowers, in the form of a ſpike. They each conſiſt of a ſingle leaf, cut into five parts, ſupported by a long greeniſh calyx; theſe are ſucceeded by five oblong, pointed, greeniſh capſula, full of very ſmall reddiſh ſeeds. This plant grows wild in Portugal, and is cultivated in the gardens of the curious. It flowers in June, and the leaves are green all the winter, but then entirely diſappear in May. The ſeeds of the former ſhould be ſown in autumn, ſoon after they are ripe, at which time they will come up very well; but if they are ſowed in the ſpring, they ſeldom ſucceed. The leaves are ſaid to be very good in external inflammations, and they may be ſubſtituted in the room of houſe-leek. Some bruiſe this herb between two ſtones, and apply it to eaſe the pain of the piles; but there are more certain remedies for theſe purpoſes

UNEDO, *ſive* ARBUTUS, *the Strawberry tree*, has a pretty thick, woody root, from whence proceeds a ſhrub or ſmall tree, whoſe trunk is covered with a rough chapped bark, and there are many reddiſh branches towards the top. The leaves are oblong, ſomewhat broad, and almoſt like thoſe of the laurel tree, for they are thick, ſmooth, always green, and finely crenated on the edges. The flowers conſiſt of a ſingle leaf, cut into five parts, which are white, beautiful, diſpoſed in bunches, and have an agreeable ſmell, with ten capillary ſtamina. Theſe are ſucceeded by fruits, that have ſome reſemblance to ſtrawberries; but they are larger, of an orbicular ſhape, with the fleſh yellow before they are ripe, and of a fine red when at maturity; it is divided into five cells, which contain ſeveral ſmall, oblong, bony ſeeds. This ſhrub is very common in Italy, Spain, and the ſouthern parts of France; it flowers in June and July, and the fruit does not grow ripe in leſs than a year. Blackbirds and thruſhes are very fond of theſe ſtrawberries, as well as women and children. There are ſome of theſe ſhrubs planted in England, and it is very common in Ireland, where the fruit is ſold and eaten. With us it has an auſtere ſour taſte, which perhaps may be owing to the coldneſs of the climate, and therefore only the branches are brought to the markets, with bunches of flowers thereon, to be made up into noſegays. They may be propagated by ſowing the ſeeds, which ſhould be preſerved in dry ſand till March, at which time they may be ſown on a moderate hot-bed, covering them with about a quarter of an inch of light earth, ſcreening them from froſt, or great rains. About the beginning of May the plants will appear, and then they muſt be weeded, watered frequently, and ſhaded in hot weather. In autumn they will be about five or ſix inches high. The bed muſt be hooped all over againſt winter, and ſhould be covered with mats and ſtraw, to keep out the froſt. About the middle of April, they may be tranſplanted into ſmall pots, which ſhould be plunged into another moderate hot-bed, to encourage their taking root, and they ſhould be ſhaded from the ſun in the middle of the day. When they are between three and four feet high, they may be ſhaken out of the pots into the open ground, where they are to remain; this is beſt done in September, when the bloſſoms are beginning to appear, and then, if they be kept moiſt, they will take root very ſoon; but in November the roots ſhould be well covered, to keep out the froſt.

URTICA, *the Common Nettle*, has a ſlender, fibrous, creeping root, of a yellowiſh colour, with ſtalks that riſe to the height of three feet, which are ſquare, furrowed, ſtiff, covered with a ſtinging hair, hollow, branched, and furniſhed with leaves, placed oppoſite to each other by pairs; theſe are oblong, broad, pointed, dentated on the edges, and full of ſmall ſtinging prickles. The flowers grow on the tops of the ſtalks and branches, under the leaves, and are each compoſed of ſeveral ſtamina placed in a calyx, with four leaves of the colour of graſs; but they leave no ſeeds behind them; for this reaſon, they are diſtinguiſhed into male and female. The male does not flower at all, but form pointed capſula, that ſting when they are touched, and each of theſe contain

tain an oval, flattiſh, ſhining ſeed. The female bears nothing but flowers without any fruit, according to the vulgar diſtinction; for the botaniſts call thoſe male flowers that produce no ſeeds, and thoſe female flowers that are ſucceeded by ſeeds. This plant grows almoſt every where, in great plenty; it flowers in June, and the ſeed is ripe in Auguſt. The leaves decay every winter, but the roots continue, and ſend forth freſh leaves in the ſpring.

URTICA MINOR, the *leſſer ſtinging Nettle*, has a ſingle, pretty large, white root, furniſhed with ſmall fibres: the ſtalks are from half a foot to a foot in height, and are pretty thick, ſquare, hard, furrowed, branched; and ſtinging, but not ſo ſtrait as the former; the leaves are placed oppoſite to each other by pairs, and are more ſhort and blunt than thoſe of the common nettle; they are alſo deeply dentated on the edge, and ſting greatly when touched. The flowers conſiſt of ſtamina, diſpoſed into ſmall bunches, in the form of a croſs, and of a graſs green colour. Some of theſe are male, and others female, as in the former. Theſe grow commonly by the ſides of houſes, and among the ruins of old buildings; both root and branches periſh every year, and they are renewed by the ſeeds in the ſpring.

URTICA ROMANA, *Roman Nettle*, has a fibrous, yellowiſh, annual root, that ſends forth a ſtalk to the height of four or five feet, which is round, branched, and furniſhed with ſtiff, ſtinging prickles. The leaves are placed oppoſite to each other, and are broad, pointed, deeply dentated on the edges, and are covered with a rough ſtinging, ſhining hair. The flowers are like thoſe of the former, and are ſucceeded by ſmall globes of the ſize of a pea, all rough with prickles, and compoſed of ſeveral capſulæ, that open into two parts, and have each an oval, pointed, flattiſh, ſmooth, ſlippery ſeed. It grows as well in cold as hot countries, in hedges, meadows, and among coppices. It is not ſo common as the two former, for which reaſon there are ſome that ſow the ſeed in gardens; it flowers in ſummer, and the ſeed is ripe in July and Auguſt. Some call this the pill-bearing ſtinging nettle, with ſeeds like flax. Theſe may be ſown at the latter end of March, upon a bed of light rich earth; and when the plants are come up, they ſhould be removed into beds on the borders of the pleaſure garden, among other plants; becauſe it is common for perſons to gather ſprigs of ſeveral ſorts to ſmell to, and conſequently this among the reſt, and this is deſigned to ſting them for the ſake of mirth. The juice of nettles is recommended to ſtop ſpitting of blood, and other hemorrhages, and the doſe is from two ounces to four. Some would have the infuſion of the leaves of nettles, made like tea, to be given in the gout, the rheumatiſm, the ſtone, and gravel. It is common in many places to make pottage with the young ſhoots of nettles in the ſpring, to cleanſe the blood. The roots of nettles made into a decoction, are ſaid to be a good remedy againſt the jaundice, and to promote expectoration in an old cough, as well as in the aſthma and pleuriſy.

VULNERARIA RUSTICA, *Kidney-Vetch*, or *Ladies Finger*, has a ſingle, long, ſtrait, blackiſh root, with ſtalks that ariſe to the height of a foot, which are ſlender, round, downy, a little reddiſh, and lie upon the ground. The leaves are placed by pairs along one ſide, and are terminated with a ſingle leaf like thoſe of Goats Rue, but a little ſofter; they are hairy underneath, inclining to white, but of a yellowiſh green above, with a ſweetiſh acrid taſte. Thoſe which ſuſtain the flowers on the tops of the branches, are broader than the reſt. The flowers grow on the tops of the branches, and are yellow, papilionaceous, and have each a calyx like a tube, which are ſucceeded by ſhort pods filled with roundiſh ſeeds, that are contained in a membranous bladder, and was before the cup of the flower. It grows in mountainous, dry, ſandy places, or on chalky grounds in divers parts of England. It flowers in May, and June, and the ſeed is ripe in July and Auguſt. It has been accounted good for healing freſh wounds, but it is now out of uſe.

UVULARIA MAJOR, *Throat-wort*, has a thick, long, branched, white root, that ſends forth ſeveral branches, to the height of three feet, which are ſometimes as thick as a man's little finger, and are angular, furrowed, hollow, reddiſh and hairy. The leaves are diſpoſed alternately along the branches, and are like thoſe of the common nettle, but they are more pointed, and thoſe below have long pedicles. The flowers are made like a bell, cut on their edges into five parts, and are of a blue or violet colour; but ſometimes they are white, hairy within, and ſupported by a ſmall calyx, cut likewiſe into five parts, and they have five ſhort capillary ſtamina in the middle, with flat ſummits. The calyx is ſucceeded by a membranous, roundiſh, angular fruit, which is divided into ſeveral cells, with holes on their ſides, and contain ſmall, ſhining, reddiſh ſeeds. This plant grows frequently in woods, hedges, meadows, and in ſhady places; it flowers in ſummer, and the ſeed is ripe in autumn. Some cultivate it in gardens for the ſake of the variety of the flowers. They are only propagated by parting the roots, for they do not produce ſeeds in England; the beſt ſeaſon for removing them is about Michaelmas, when the roots may be ſeparated and planted on the borders of the flower garden. This plant is aſtringent, deterſive, and vulnerary, and the decoction of it has been made uſe of againſt inflammations of the mouth and throat; but it muſt be only exhibited in the beginning of the diſorder.

XYRIS, *ſive* IRIS FŒTIDA, *ſtinking Gladden, or Flag*, has a round root, pretty much like an onion while it is young. But afterwards it grows crooked, knotted, and is furniſhed with pretty thick fibres; it ſends forth many roots a foot and half or two feet in length, that are more narrow than the common Iris, and as ſharp as the end of a ſword; they are of a blackiſh ſhining green, and have a ſtinking ſmell like bugs. Among theſe leaves ſeveral ſtrait ſmooth ſtalks ariſe, on the top of each of which there is a flower like that of the Iris, but ſmaller, and compoſed of ſix petals or leaves of a dirty purple, inclining to blue. Theſe are ſucceeded by oblong angular fruit, which open like the male piony, and diſcover round ſeeds, as large as ſmall peas, of a red colour, and of an acrid burning taſte. It grows in moiſt places, on the ſides of hedges, among buſhes, and in ſhady valleys. It flowers in July and Auguſt, and the ſeed is ripe in autumn. It is cultivated in the gardens of the curious, and grows readily every where; however, it does not grow in many places ſpontaneouſly in England. The root and ſeed, taken in decoction, are ſaid to be aperient, to purge off water, and to be good in the rheumatiſm and dropſy. A doſe of the dried root, in powder, given in white wine, is a draehm. Some account it excellent in the king's-evil, and in the moiſt aſthma; but its principal virtue is to purge off water, and to diſſolve clammy humours.

OBSERVATIONS

OBSERVATIONS on HOT-BEDS,

AND

WATERING of PLANTS.

HAVING frequently recommended the uſe of Hot-beds, for the raiſing of particular Plants mentioned in the preceding part of the Natural Hiſtory of Vegetables, it may not be improper here to conſider that ſubject more at large, as well as to give the inexperienced ſome idea of the proper obſervations to be made previous to watering of plants. Without a perfect knowledge of theſe ſubjects, it will be in vain to attempt to rear any tender plant, or, indeed, to make any tolerable progreſs even in common gardening.

A hot-bed is the common help made uſe of by gardeners to forward the growth of a plant, and force vegetation, when the ſeaſon of itſelf does not afford a ſufficient warmth. By the help of this, if it be ſkilfully managed, the hotteſt climate of the world may be ſo nearly imitated, that the ſeeds of thoſe plants, which are brought from any country, may be here made to vegetate and flouriſh in England.

In order to have a right underſtanding of the hot-bed, we muſt conſider what degree of heat is required for the growth of the plant we intend to cultivate; for nature muſt be imitated as near as poſſible, and not forced or exceeded, if we hope for ſucceſs in our undertaking.

Heat and moiſture are certainly the rudiments of vegetation; and therefore, whoever would promote the growth of a plant, muſt contrive how to have them in ſuch due proportion, as that neither one nor the other exceeds thoſe limits, which nature has allotted for the growth of plants. A dry heat, we find from experience, rather ſcorches and ſhrinks a plant, than make it grow; and wet, if it is not quickly exhaled from the root of a plant, chills it, and often injures it paſt recovery. A moderate ſweating heat, therefore, is moſt deſirable, ſuch as is raiſed by the ferment of wet ſtraw or horſe litter, which for a time will ſend forth, from the earth lying upon it, that gentle ſteam, impregnated with vegetative ſalts, which we find contributes ſo much to the growth of plants, beſides putting thoſe juices into motion, which are lodged in the root, and circulating them through the proper veſſels.

The ſteam, which is ſuppoſed to riſe from the root into the wood veſſels of plants, to furniſh them with ſap, will indeed of itſelf keep a plant alive; but then, at the ſame time, the bark, leaves, and other ſpongy part of a plant, which encompaſs the ſap veſſels, if they are too dry, will ſhrink and pinch thoſe veſſels ſo very cloſe, that they then cannot admit the ſap to circulate through them in ſuch quantity, as is neceſſary to ſupport the plant in vigour: on the contrary, when the ſpongy parts of plants are kept moiſt by the aſcending vapours, which continually riſe round about them from the earth, then the ſap veſſels are alſo more open, and at liberty to receive the nouriſhment riſing from the roots.

To explain this, let us conſider thoſe plants, which are cultivated in pots, and ſet ſingly in chambers, and other places of the houſe, for ornament in ſummer, though we allow them large pots, freſh earth, and water enough, as well as air, as much as they have in a green-houſe, yet they ſenſibly decline in a few days. This happens principally for want of that ſteam, which is always abroad, more or leſs, riſing from the earth in the day, and condenſing and falling upon them at night. Nor can the pots, ſet ſingly in a chamber, have this help, as thoſe have, which are ſet together for ſhelter during the winter in a green-houſe; for the number of pots, in a collection of plants, afford ſteam enough to nouriſh one another, which one ſingle pot cannot.

The like is to be obſerved in a dry ſeaſon, when we are forced to water plants that ſtand abroad; they are by that help but juſt kept alive, becauſe the earth round about them is ſo dry, that it hardly emits any ſteam, or at leaſt not enough to ſupport them. However, no ſooner does the rain fall, than we find a contrary effect, as the vapours then riſe from the earth every where about the plants, and make them flouriſh. Hence a hot-bed appears to be of uſe ſo long only as it can ſend out ſuch vapours from the earth lying upon it, as are neceſſary for the ſupport of the plants. When it wants the heat, which is required for that purpoſe, it muſt be renewed; otherwiſe the moiſture, which muſt be maintained to nouriſh the roots of the plants growing in it, will chill and deſtroy them. We muſt not here be ſuppoſed to mean the ſteam, which ariſes from the dung itſelf, for that is known to be deſtructive to all plants; we mean the vapour only, which the heat of the dung evaporates from the earth lying upon it, and which will help the plants; but even this muſt be tempered and well qualified, leſt it ſhould ſcorch them. It may be moderated according to your deſire, by laying on your earth of a thickneſs proportionable to the heat of the dung below it.

Having now conſidered the qualities required in a hot-bed, let us proceed to give proper directions for making it. Throw up a load of freſh horſe-dung in a heap, mixing it well together, and then let it remain for a week or ten days, by which time it will ferment, and come to a proper heat. The bed then muſt be marked out, anſwerable to the ſize of your frames, the length of it running from eaſt to weſt, ſo that it may face the ſun. Some gardeners dig a trench a ſpit deep to make the beds in, and others ſave that trouble, and make it all above ground. The ingenious Mr. Bradley tried both ways, and found ſo little difference, that he could not ſay which was beſt. However, if the ground be wet and ſpringy, it is beſt to make the bed quite above ground, otherwiſe the dung may be chilled. In the ſpreading of the dung, care muſt be

be taken to lay it equal in every part, that, when the bed comes to ſettle, it may not lie uneven; and, beſides, that it may heat altogether.

Your bed being thus prepared, ſet on your frames, and put the earth you deſign for it upon the dung, laying it ridge-wiſe, that it may be more conveniently turned over, as you ſee occaſion, if the bed ſhould burn. When you find the extreme heat begin to abate, level the earth upon it, in order to ſow your intended ſeed, always obſerving to have upon your bed the depth of ſix or eight inches of earth, to prevent the extreme heat of the dung from ſpoiling your crop; for, ſhould the roots of whatever you ſow or plant touch the dung, they will certainly be ſpoiled. To theſe directions ſhould be added a careful obſervation of thoſe, who make hot-beds; for theory and practice cannot be divided, and the one is indiſputably neceſſary to gain a complete knowledge of the other.

As to the earth, proper to cover the dung of hot-beds, it ſhould always be light, freſh, and well ſifted; for you ought to conſider how tender the roots of thoſe plants will be, which you there intend to produce. The beſt compoſition for this purpoſe is ſandy loam, mixed with an equal part of well-rotted horſe dung; let theſe lie in a heap together, and be ſcreened or ſifted when wanted.

From theſe conſiderations on hot-beds, let us turn our attention to conſider, what kind of water is the moſt proper to increaſe the health and vigour of plants. It has been found, from repeated experiments, that the cleareſt water is not to be preferred, nor ſuch as comes immediately from a cold ſpring; neither ſhould it be harſh, but rather ſoft and muddy. A ſtagnating water, that is well expoſed to the ſun, ſeems to be the beſt for the health of any plant. Pure rain-water, if it can be had without any mixture, is the beſt of all; for enriched or fattened water, becoming ſuch from dungs or other forcing ingredient, proves always fatal to plants, if not rightly underſtood: at beſt, it can only contribute to make a plant grow ſomething the quicker, and ſuch forcing of nature always proves of ill conſequence, as well to plants as animals, by ſhortening their lives.

Indeed, when annual plants are the objects of conſideration, it may ſometimes be of ſervice to uſe theſe provocations, the better to bring them to perfection within the compaſs of our ſummer; but then they muſt be applied conſiderately, and a right kind of mixture prepared for each reſpective ſort of plant; for we muſt not imagine, that one ſort of mixture, however fattening it may be, will alike contribute to the welfare of every ſort of plant. Mr. Bradley found by experience, that the black water, taken from a dunghill, will make a cabbage, or any of that race, proſper extremely; but having uſed the ſame water to other plants that were aromatic, and whoſe texture of parts was more cloſe, ſuch as myrtles, thyme, and the like, it ſoon killed them. This ſhews, that gardeners ought not to confide in the richneſs of any one particular kind of water for the welfare of every ſort of plant, any more than a ſkilful phyſician will preſcribe always the ſame medicine for the relief of every kind of complaint.

There is another thing to be conſidered in preparing water for plants, which as yet ſeems to be very little regarded; that is, when we mix pigeon's dung, or rather ſuch like ingredients in water, we muſt allow them due time to ferment before we uſe them, otherwiſe they will injure the roots watered with them, and that will diſtemper the plants, which in the end may kill them, as we find from experience is frequently the caſe.

Mr. Evelyn very juſtly obſerves, ſpeaking of theſe mixtures, that they ſhould not be uſed till they are ſufficiently ſweetened and purged from their predominant acrimony. That gentleman ſaw many plants deſtroyed by the uſe of unripe mixtures, though the ſame preparations, when fully maturated, performed wonders in forwarding the growth of the ſame kind of plants. The proportions of every ingredient ought to be reaſonably conſidered, and the quantities not increaſed too haſtily, merely becauſe a moderate quantity has already begun to ſhew its good effects. However, a few obſervations, to an ingenious perſon, who loves a garden, will ſoon make him a proper judge of theſe matters.

Let us now return to plain water, which is undoubtedly the moſt natural to plants. Of this, uſe only ſuch, if poſſible, that has ſtood in the ſun ſome days to ſoften, either in ciſterns, or pits dug in the ground, which laſt is preferred by Mr. Bradley; but even this ſhould not be uſed inconſiderately: we ſhould conſider the moſt proper ſeaſon for uſing it, and the beſt method of refreſhing plants with it.

In the firſt place, we ought to water all plants in the morning, in ſuch ſeaſons when the nights are froſty, and in the evening in the warm ſeaſons. The reaſon of the firſt is, that too much wet, lying about the roots of plants, chills and pinches them ſo much, if it happens to freeze, that they often periſh; but, if it be given in the morning, where there is likelihood of a warm day, it gives the plant ſuch nouriſhment as it requires from it, and is dried up before the froſt of the evening can have power over it. Morning waterings ſhould therefore be in Auguſt, September, and October, March, April, and the greateſt part of May. From that time, to the middle of Auguſt, chuſe the evenings for that work; becauſe then the extreme heat of the ſun would over-heat the water given in the morning to the plants, and ſcald their roots, beſides drying it up too quick, before the plants could receive due nouriſhment from it. Obſerve never to uſe evening waterings after the ſun is down, without great neceſſity.

In either of theſe waterings, care ſhould be taken to do it as near the ground as poſſible, and not to hold the watering-pot too high; for that would waſh the earth from about the roots of the plants, and contribute to make the ground hard, when the ſun comes to ſhine upon it, and ſo bind the roots too much. Before you water, obſerve always, that the earth be open, and looſe about the roots, and, above all, avoid, as much as can be, wetting the leaves; for, if the froſt comes upon them before they are dry, it will pinch and rot them; and, if the ſun ſhines hot upon them while they are wet, it will ſpot and change their colour.

Beſides theſe ſimple waterings, cauliflowers, cucumbers, and thoſe plants which have large veſſels, ſhould be floated; that is, the alleys between the rows ſhould be dammed up at each end, and filled with water. One of theſe floatings will do more ſervice than ſix waterings cloſe to the ſtems; for they feed and nouriſh the extreme fibres, which alone want this help, and put the earth in ſuch a condition, that the ſmalleſt warmth of the ſun will evaporate that ſteam from it, which is ſo neceſſary to plump the principal parts of the leaves and ſtalks.

It is a rule to be obſerved in the watering of plants, that, while they are not growing, they ſhould be kept as dry as poſſible; but, at the time of their growth, they ſhould never want water, giving them frequently a little at a time, and chiefly when they are in bloſſom: for if, by accident of weather, the water lies long about the roots of plants, it chills them, and checks their growth. It is alſo to be obſerved, that ſuch plants as are very ſucculent or juicy, ſuch as houſe-leek, &c. muſt have little water,

water, as they contain moiſture enough in themſelves for their nouriſhment, and feed chiefly upon the air, which they imbibe and condenſe in their ſpongy parts, as having fewer ſap veſſels than any other kind of plants. Mr. Bradley, in his Hiſtory of Succulent Plants, lays it down as a rule, that the more ſucculent any plant is, the leſs water it requires; while thoſe, that have the greateſt proportion of ſap veſſels, and the leaſt ſpongy parts, require frequent waterings, which we find to be true from common experience in the garden, and by examining the ſtructure of water plants, ſuch as willows, &c. which are for the moſt part compoſed of ſap veſſels, and are therefore ſo tough, that they may be wrought into any figure without breaking; but all juicy plants are brittle for want of theſe veſſels.

In ſhort, if we were to examine with the microſcope the numbers and ſizes of the ſap veſſels, in every ſort of plant we intended to propagate, we might come to a certainty of the proportion of moiſture every plant required.

A NEW,

A

NEW, COMPLETE, and UNIVERSAL BODY, or SYSTEM of

NATURAL HISTORY;

Being a Grand, Accurate and Extenſive

Diſplay of Animated Nature.

B O O K V.

Containing the Natural Hiſtory of WATERS, EARTHS, FOSSILS, *and* MINERALS.

INTRODUCTION.

THOUGH the great Author of the univerſe has been pleaſed to caſt a veil over many things, yet we are not to imagine, that he has for that reaſon forbid our enquiries into them. That veil is not always impenetrable: from whence we may infer, that there is implanted in our nature a thirſt after knowledge; and, as we are ſurrounded with objects of admiration, though we are perfect ſtrangers to their firſt principles and moſt ſecret cauſes, our gratitude is always increaſed, and our ideas enlarged, in proportion to the diſcovery we make of their ſtructure, contrivance and grandeur.

It is to the Earth we are indebted for the conveyance of thoſe particles of Water, which in particular places, by collecting themſelves together, form ſprings and fountains. Let us purſue one of theſe ſprings, inſignificant as it firſt appears, through its gradual progreſſion and increaſe. It is at firſt nothing more than a vein of water, iſſuing from ſome hill upon a bed of ſand or clay. The little ſtones that are diſperſed around it are not ſufficient to interrupt its current: it turns and winds, and murmurs as it rolls along. At laſt it clears its way, falls in a torrent down upon the plains, and ſwells by being united with ſome other ſtreams. It hollows the ground by the rapidity of its fall, and throws up the earth on each ſide of it: it inſenſibly forces its way through every thing that obſtructs its paſſage, and digs a bed or channel for itſelf. The overflowings of the adjacent ponds, the ſnow that melts and trickles down the hills, and the additional ſupplies of brooks and rills that fall into it, fortify and enrich it. Then it aſſumes a name, and ſteers its courſe along the ſides of flowery meads, it takes a tour round the hills, and grates, as it turns and winds, the ſpacious plains. It becomes the general rendezvous of almoſt all kinds of living creatures: a thouſand little party-coloured birds, of various notes, divert themſelves upon its ſandy banks, ſkim over its ſurface, and dip their wings in its refreſhing ſtreams. This is their favourite place all day, and, when the approach of night compels them to withdraw, they quit it with reluctance. Then the wild beaſts enjoy it in their turn; but, at break of day, they leave the plains to man, and the free uſe of the river to the cattle. The numerous herds forſake their paſtures twice a day to pay their uſual viſits to the ſtreams, in which they quench their thirſt, or ſeek ſome cool retreat. The river, in ſhort, is as delightful to us as it is to them: for the moſt part, we reject the hills and woods, and fix our habitations on its banks. When it has enriched the fiſherman with a profuſion of its ſtores, and refreſhed the farmer's thirſty plains; when it has adorned the pompous ſeats of the nobility, with the moſt delightful proſpects, and made the country every where agreeable, it pays a viſit to thoſe large towns that are indebted to its friendly ſtreams for all their wealth and commerce. It is probable, that the mighty waters of the Danube and the Volga of Europe, the Nile and the Niger of Africa, the Ganges and the the Euphrates of Aſia, and the Amazons river and Rio de la Plata of America, owe their firſt ſource to ſome ſuch trifling ſprings.

It may not here be improper to inform the younger part of our readers, in what manner ſprings receive their ſupplies. Hills and mountains contribute not a little to that purpoſe: At the bottoms of ſuch mountains, whoſe tops are for ever covered with ſnow, (and of this kind are the Alps and the Pyrenees) we find ſprings, for the moſt part, which begin to flow in May, but run no longer than September, the

the cauſe whereof may be eaſily accounted for. As ſoon as the ſun has advanced ſo near to one of the tropics, as to be able by its genial rays to warm the tops of the mountains, the ſnow which covers them diſſolves, inſinuates itſelf through the pores of the earth, and ſinks either abſolutely down to the bottom of thoſe hills, or at leaſt into their bowels, where its progreſs being obſtructed by beds of clay or ſtone, it gathers together in a body, and there forms a variety of fountains; but no ſooner does the ſun deny its benign influence, than the fountains ceaſe to flow. However, as there are many ſprings, which are never dry, and which are far diſtant from any hills or mountains, let us enquire from whence theſe receive their inexhauſtible ſupply of water: This is undoubtedly from the rains that fall, which inſinuate themſelves into the bowels of the earth. It is an univerſal complaint, that moles, worms, field-mice, and a thouſand other vermicelli, or little inſects, are very pernicious to the earth in hot ſeaſons, by their grubbing it up, and digging an infinite number of little holes in it of various depths; but the injury they do that way is amply recompenſed by thoſe numberleſs inlets, which they open for the rain, at ſuch times when we ſtand moſt in need of it: and thoſe crevices or chaſms, which gape, as it were, on the ſurface of the earth in times of exceſſive droughts, render the paſſage of the water to the inferior layers more eaſy and expeditious. Thoſe particles of water, which thus fall in ſhowers, inſinuate themſelves with eaſe through beds of ſand and porous earth, till they are obſtructed in their paſſage by more compact beds of clay or ſtone, on which they reſt, and there form one large baſon or reſervoir. The earth is almoſt every where full of thoſe veins of ſand, through which the water is perpetually paſſing; and ſome of thoſe veins, having undoubtedly a communication with particular rivers, may either empty their own ſuperfluities therein, or receive a ſupply in dry ſeaſons. It is probable, that many of thoſe ſprings, which do not vary in their height with the ſeaſons, may receive their ſupply from ſome ſuch ſource. That ſpring water ſhould be warmeſt in the ſevereſt weather, ſeems eaſily to be accounted for: it is well known, that the earth abounds with particles of a ſulphureous nature, which in warm weather eſcape through its pores, and exhale in vapours; but this is prevented when the ground is frozen ſo hard, as to form one ſolid impenetrable maſs. The fire, thus confined deep in its boſom, will conſequently act with more force on every thing it meets with, and will naturally give a greater degree of heat to the water that paſſes through it.

Hence we may conclude that thoſe things, which we often look upon with indifference, nay ſometimes conſider as prejudicial, are frequently of the greateſt conſequence and importance to us: the ſea, though the ſaline particles it contains makes its waters very nauſeous, is in reality the firſt ſpring which ſerves to quench our thirſt; the wind, though we are very apt to complain of it, brings us our vapours from the ſea; the lofty ſummits of the mountains, though conſidered by many as uſeleſs, help to ſettle and condenſe them; the holes, chaſms, and crannies, which render the earth ſo hideous and deformed, ſerve as ſo many conduits to convey the waters to their proper ſtations; and the beds or layers, though ſunk ſo much beneath our ſight, are formed to retain them.

Let us now turn our attention from the watry element, and take a ſlight view of the different ſoils and moulds, which the Earth produces. In theſe we ſee ample proviſion made for the various plants and vegetables they nouriſh and ſupport. Some trees, plants, and grains, dwindle and die in ſome ſoils, but thrive and flouriſh in others. If ſome delight in a warm, ſome in a cold ſoil, others do beſt in that which is lax, ſandy, or clayiſh; ſome in a moiſt, others in dry places; ſtill we find proviſion enough for all theſe purpoſes. Every country abounds with its proper trees and plants, and every vegetable flouriſhes and is gay ſomewhere or other about the globe. To this convenience, which the various ſoils of the earth are of to vegetables, we may add their great uſe and benefit to innumerable animals, to many kinds of quadrupedes, fowls, inſects, and reptiles, who make in the earth their places of repoſe and reſt, their retreat in winter, their ſecurity from their enemies, and their neſts wherein to repoſe their young; ſome delighting in a lax and pervious mould, admitting them an eaſy paſſage, while others ſeek a more firm and ſolid earth, that will better ſecure them from injuries without. In one place we are provided with chalks, okers, and boles, of all ſorts, for medicinal uſes, and of all colours, proper for drawing the outlines or ſketches of any deſigns we propoſe to accompliſh, or for painting ſuch objects as may contribute either to our profit or delight. In another, we have various kinds of marl, which is ſo juſtly admired by our maſons for its incomparable chalk, and more particularly by our farmers, who look upon it as an ineſtimable treaſure. In ſeveral parts of England, but particularly in the barren regions of the north, there are beds or ſtrata of bituminous earth to be met with, commonly called either Sea or Scotch Coal. Thus Nature provides fuel for the inhabitants of thoſe countries, whoſe climate requires a more powerful warmth than what is afforded them from the benign rays of the ſun, and thus makes amends for the want of thoſe bleſſings, which are beſtowed on more ſouthern countries. Expoſed to the ſeverity of the cold northern blaſts, they ſtand more in need of what they dig out of the bowels of the earth, than of what we find on its ſurface. There, ſtrangers to the delicacies of life, they are contented with humble neceſſaries.

Mankind, in order to live with decency and pleaſure, muſt be ſupplied with a vaſt variety of accommodations: for this purpoſe they are furniſhed with an infinite number of Foſſils, which are intended by Providence as a treaſure that ſhould never be exhauſted. Theſe are carefully lodged in ſpacious repoſitories under our feet, where we may infalliby find them upon all emergencies. Theſe uſeful materials do not lie buried in the centre of the earth, nor ſo deep in the bowels of it, as to be inacceſſible; but are planted at a convenient diſtance from its ſurface, that the ſoil may produce its proper fruits, in due ſeaſon, without interruption. By this wiſe direction of Nature, our habitations are richly furniſhed both within and without, and the ſame ſpot of ground produces for our ſervice a kind of double harveſt.

From theſe conſiderations on foſſils, let us turn our attention to thoſe immenſe beds of Stone, which lie buried in the earth. Had all thoſe vaſt maſſes, which lie under ground, been lodged up and down on its ſurface, we ſhould have been much embarraſſed, and had but little room left for the erection of our houſes: had they proved as hard in the quarry, as they grow afterwards, all the art of man could never have been able to dig or cut them; and had they continued in their original ſtate of ſoftneſs, when expoſed to the open air, our houſes would have never been ſecure. When the deſcendants of Noah were reduced to the neceſſity of diſperſing into diſtant countries, in order to ſeek out commodious ſettlements for themſelves and their families, they found every place over-run with woods, and inhabited by an infinite number of ſavage beaſts. By the help of a few boughs, and the ſkins of ſuch beaſts as they killed in the chaſe, they erected at firſt a few huts or tents,

which ſerved to ſhelter them from the injuries of the weather. As they were not, however, at that time, always ſafe and ſecure from the attacks of thoſe devouring beaſts, nor from the mercileſs inſults of their more ſavage fellow-creatures, what a peculiar providence was it for them, who as yet lived in a reſtleſs uneaſy ſtate, to find under their feet, and at a moderate diſtance from the ſurface of the earth, ſuch immenſe quantities of matter, that was ſoft enough to be cut and faſhioned according to their pleaſure, and yet ſo ſolid at the ſame time, when expoſed to the open air, and diſpoſed in a proper manner, as to ſecure them not only from the moſt outrageous ſtorms, but from the inſults of their private enemies; and, at laſt, to defend whole kingdoms from any hoſtile invaſions! By this means, in proceſs of time, both villages and cities aroſe out of the earth, and men attained to the art of lodging and cementing the moſt unwieldy ſtones in the cloſeſt manner; of building for themſelves commodious habitations, impregnable fortreſſes, and magnificent palaces for the reception of their princes and rulers; and, in fine, thoſe ſolemn and pompous temples, in which all the families then on earth met together at ſtated times, to pay their tribute of gratitude and worſhip to their common Parent, to viſit one another without pride or reſpect of perſons and to lay themſelves under the moſt ſolemn engagements, inviolably to perform all thoſe good offices one towards another, on which the welfare of an amicable ſociety entirely depends. We ſhall not here enter into any enquires, how theſe immenſe ſtones are formed, ſince that matter is fully explained in its proper place; we ſhall only add, that beſides theſe huge maſſes, which the earth provides us for building our habitations, there are others, though leſs in bulk, of infinitely more value, ſuch as diamonds, rubies, carbuncles, and a thouſand other precious gems, which adorn the inſides of the moſt ſumptuous palaces, and grace the diadems of ſovereigns.

We come now to the laſt point of conſideration, that of Metals, of which gold is undoubtedly the firſt that claims our attention. The preference, which we give to this above all other metals, is by no means the effect of prepoſſeſſion or caprice: the ſuperior regard we pay to it is grounded on its intrinſic and inherent merit. There is no metal ſo ſolid and compact, ſo weighty, or ſo capable of being refined to ſo great a degree of perfection: it is, beyond all contradiction, of the moſt beautiful colour, and comes neareſt to the radiancy of fire: it is the moſt ductile and obedient to the workman's hands of all metals whatever, and never ſoils or beſmears them, as others will. The leaſt particle of it gives an additional grace to every thing it touches, and has one other excellent quality, which is that of its never ruſting, nor will it loſe any thing of its weight while refining in the fire. It is therefore not at all ſurpriſing, that mankind ſhould unanimouſly agree to fix upon a metal of ſo pure, ſo ſolid, and durable a nature, in order to pay for and procure ſuch various accommodations as they indiſpenſibly wanted. Before the diſcovery of this precious ore, trade and commerce were carried on by way of barter: wine, for inſtance, was exchanged for oil, corn for flax, and one commodity was mutually agreed to be accepted for another, as occaſion required. This method, however, of negociating buſineſs, was attended with a thouſand inconveniencies: two contiguous nations or provinces might poſſibly be over-charged with the ſame commodity; or, ſuppoſing the products of their grounds to be different, yet it created abundance of trouble to make a juſt computation of their real and intrinſic worth, inſomuch that it was no eaſy matter to adjuſt an equivalent in the wholeſale trade, though practicable in the retail way; and men were often obliged, with reluctance, to diſpenſe with many things, for want of ſuch accommodations, as were agreeable to thoſe who were poſſeſſed of them. Now, gold being a metal of a pure, ductile, and incorruptible nature, was conſidered by them as the moſt agreeable and proper ſubſtance, of which to make a general ſtandard, and the moſt commodious equivalent that could poſſibly be given in exchange for all the accommodations and conveniencies of life whatever. As this radiant ore was very ſcarce, they agreed, with one voice, that a ſmall quantity of it ſhould be deemed a ſufficient compenſation for a large portion of any other merchandize. They wiſely conſidered, how great would be their advantages, to be enabled, by virtue of a ſmall portion of ſuch precious metal, (which is little or no incumbrance to a traveller, and which he can eaſily conceal from the eyes of thoſe, who might otherwiſe be diſpoſed to oppreſs him) to take a tour all round the habitable world, in order to furniſh them with whatever conveniencies they might want, and to defray all their neceſſary expences, without the leaſt dependency, incumbrance, or enquiry. This method of tranſacting buſineſs was found to be ſo expeditious and convenient. that, in proceſs of time, the practice became univerſal. There was one little inconvenience, indeed, that at firſt attended it: every merchant was obliged to carry his ſcales and weights in his pocket, in order to know the intrinſic value of the gold he received; but an expedient was ſoon found out to ſave him the trouble, by making little thin pieces of gold, which afterwards introduced thoſe of ſilver, with ſome known and public figure impreſſed thereon by the authority of government, to ſettle and determine their real value, that he, who delivered his goods, might be well aſſured, that he received ſo much gold or ſilver, of ſuch a weight and ſtandard, in return. As gold, however, was reſerved on account of the great ſcarcity of it, to diſcharge and pay off large ſums, with the utmoſt expedition, they had recourſe to baſer and more common metals for their daily diſburſements and their retail buſineſs.

The obedience of this metal, under the hands of the gold-beater and wire-drawer, is not only ſurprizing, but a perfect prodigy; and, if we were not eye-witneſſes of it, we ſhould never be prevailed on to think it practicable. By the art of the gold-beater, a piece of this metal, of only an inch ſquare, and not thicker than paper, is hammered out into a thouſand leaves, each of four inches ſquare. The following operation, though equally common, is much more ſurprizing. A gold wire-drawer takes an ingot or bar of ſilver, of a cylindrical form, two feet and eight inches in length, and two inches and nine-twelfths of an inch in circumference. Upon this he ſpreads as many leaves of beaten gold as weigh, in the whole, exactly half an ounce. He then drives the extremity of this cylinder with force through a round hole that is made in a ſteel plate, the entrance whereof is wider than the other end, which is called the eye. After this the ingot is paſſed through ſeveral holes ſucceſſively that are one finer than another. Thus, by ſlow degrees, it is reduced to the thinneſs of a reed, a coarſe thread, and at laſt, after having paſſed through upwards of an hundred and forty holes, acquires the minuteneſs of the fineſt hair. The moſt ſurprizing part, however, of this operation is, that the half ounce of leaf gold, which firſt covered the ingot of ſilver, ſhould, notwithſtanding its former degree of fineneſs, grow gradually ſtill finer and finer as it paſſes through the different wire holes, and cover the ſurface of the ſilver ſo very exactly, as that no part of it whatever ſhould be ſeen: it appears, in ſhort, one entire thread of gold. Thus half an ounce of gold may be made

to extend itſelf into a ſurface of about ſeventy-three leagues in length. Hence we may plainly perceive, that the internal nature of this metal, and, in all probability, that of all other ſubſtances whatſoever, is beyond human comprehenſion.

The uſes of copper and tin, for domeſtic purpoſes, are well known to every one; and there is not a metal that can be mentioned, but what has ſome uſeful property: yet that very metal, which to all outward appearance is the meaneſt and leaſt poliſhed, which abounds moſt with allay, is of a dark and gloomy hue, and the moſt liable to ruſt—yet that very metal, *iron*, is more beneficial and advantageous to us than all the reſt. It has one particular quality, which alone is ſufficient, in ſome meaſure, to give it the precedence to all others, and that is, it is more hard and tenacious, which renders it every way qualified for the moſt laſting purpoſes. By being thus able to reſiſt the ſtrongeſt efforts, it becomes the guardian, as it were, of our houſes, and our moſt faithful truſtee. By linking thus inſeparably together the materials of which our habitations are compoſed, it ſecures our perſons, not only from the injuries of the weather, but from the hands of mercileſs and violent men. To this metal we are indebted for the greateſt part of our utenſils, which are made uſe of, not only in navigation, huſbandry, and clock-work, but in all other liberal and mechanical arts. Gold and ſilver, had we not iron implements to work and fit them for our ſeveral purpoſes, would be in a great meaſure uſeleſs. We are ſo much indebted to this particular metal, that our daily proviſions could not be commodiouſly dreſſed, nor ſhould we well know how to divide them for eating, without it. To ſum up its ſuperior excellency in a few words: all other metals, indeed, are uſeful; but this is abſolutely neceſſary, and we can make no tolerable ſhift without it.

From all theſe conſiderations we may conclude, that we can neither look round about us, move one ſtep upon the earth, or dig under our feet, without meeting with a profuſion of thoſe treaſures, which Providence has provided either for our convenience or delight. The ſurvey of Nature, therefore, when rightly purſued, is a kind of popular theology, where all human kind, even the illiterate, may learn thoſe truths, the knowledge whereof is a concern of the utmoſt importance.

CHAP. I.

Of Medicated MINERAL WATERS.

AMONG Medicated Mineral Waters ſome are cold, and others hot; the former are called by phyſicians ACIDULÆ, that is, a little partaking of acid, becauſe ſome of them have a ſubacid or vinous taſte, eſpecially when taken immediately from the ſpring. The hot ſprings are ſuppoſed by ſome to be owing to ſubterranean fires; becauſe near thoſe places where there are volcanoes they are moſt frequent; but others think they ariſe from the fermentation of the different particles of which they partake as they paſs through different ſtrata of the earth; as for inſtance, Iron and Sulphur. But, be this as it will, their virtues are not owing merely to the heat or cold, but to the principles of which they are compoſed; for which reaſon it will not be worth while to treat of them as ſuch, but to take notice of their contents, to which their properties are owing. We ſhall therefore divide them only into four Claſſes: 1. Mineral Waters containing earthy Particles. 2. Waters impregnated with Salts. 3. Sulphureous Waters. And, 4. Waters impregnated with Metals.

1. There are mineral-Waters, which have imbibed earthy particles that have the properties of Soap, particularly the Soapy Water of Plombiers in France, which at the ſpring head is warm, and taſtes a little fat or ſoapy, with a ſmall degree of roughneſs. This is ſuppoſed to run through a ſtrata of Fuller's earth: it is preſcribed in diſorders of the ſtomach, proceeding from acidities, as well as in ſpitting of blood, exceſſive bleedings, a conſumption of the lungs, and many other diſorders, for which they are either drank or uſed as a bath. A large quantity is to be drank in a morning upon an empty ſtomach, and ſome make uſe of it for common drink.

2. Waters that have imbibed Rock Salt are not very uncommon, but they are not as ſome imagine of the ſame nature as thoſe in which common Salt is diſſolved; becauſe this latter is not a ſimple ſubſtance, but contains a mixture of Rock Salt and fixed Alcalious Salt, imbibed in the bowels of the Earth; and that which is made with Sea Water partakes of a Volatile Urinous Salt, which is the produce of the putrefaction of fiſh, ſea plants, and other marine ſubſtances, together with Bitumen and various Minerals.

It is but lately that Sea Water has been thought of any internal uſe in medicine, or at leaſt its properties have lain dormant for a great number of years, except for diſeaſes of the ſkin, for which it has been ordered as a bath; it has been recommended in all diſorders of that kind, from the itch to the leproſy, as well as pains in the limbs; and ſome have thought, and ſtill think, that it is a ſpecific againſt the bite of a mad dog. It is now preſcribed inwardly in all obſtructions of the glands, in whatever parts of the body, and the diſeaſes ariſing therefrom, for which it is both drank and uſed as a bath. It is alſo good againſt obſtructions of the kidneys, when there is no inflammation, or the ſtone is not too large to paſs; and likewiſe againſt recent obſtructions of the liver, and conſequently the yellow jaundice, when given with medicines proper for that diſeaſe. A perſon of twelve years of age may drink half a pint every morning, and an adult a pint.

The Waters of mineral ſprings, impregnated with Sal Gem, when given inwardly, open the body and promote urine; beſides which they are drying, binding, and diſcutient, whence they are good in cachexies, and the dropſy.

Thoſe Waters are ſaid to be nitrous, which abound with a Salt like the Natrum of the ancients, which ſome have miſtaken for Saltpetre; whereas it is a kind of Alcalious Salt. Thoſe ſprings that abound with it, are good for diſſolving thick clammy humours, for opening obſtructions of the bowels, as well as in a decayed appetite. When uſed as a bath, they help to reſolve ſwellings and obſtructions of the nerves.

3. There are many mineral Waters that partake of Sulphur, which may be eaſily known by the ſmell, as alſo by the ſediment that is left after it has been evaporated over the fire. Theſe are commended in diſorders of the breaſt, and foulneſſes of the ſkin, whether drank, or uſed as a bath; as alſo in trembling of the limbs, contractions of the tendons, the rickets, and ſome kinds of palſies.

Our *Bath* Waters are thought chiefly to partake of Sulphur, mixed with an exalted Vitriolic Steel. They are good in all weakneſſes and decays of the conſtitution, as well as for a debauched ſtomach. They likewiſe diſſolve viſcid and ſaline particles in the blood and humours, and ſweeten the fluids in general. Hence they are good in dropſies and conſumptions before they are too far gone; as alſo in catarrhs, cachexies, jaundice, ſcurvy, ſcorbutic rheumatiſms, aſthmas, and all diſeaſes of the ſkin, as well

well as old pains and achs; nor are they leſs effectual in many womens diſorders.

4. Theſe in general partake of iron or ſteel, though there may be poſſibly ſome of other kinds which have not been taken notice of by naturaliſts. There are many of theſe in Hungary, Germany, France, and other parts of the world, but the Pyrmont and Spa Waters are the moſt famous we have from abroad; and in England we have the Tunbridge, Scarborough, Hampſtead, and Iſlington. Theſe in general diſſolve groſs humours, ſweeten thoſe that are ſalt and acid, and open oſtructions. They are accounted good in all diſeaſes of the head, whether they ariſe from the conſent with the ſtomach, or not; they are alſo good in many diſeaſes of the breaſt, particularly ſhortneſs of breath, coughs, and and ſpitting of blood. In ſhort, they are efficacious againſt all thoſe diſtempers wherein iron or ſteel is of any uſe; and they muſt be much better, becauſe the particles of the metal are become ſo volatile that they do not change the colour of the water; but then they are apt to fly off after they have been expoſed to the air for a few days. Beſides, as it is neceſſary to drink a pretty large quantity of theſe waters, the ſolution of groſs thick humours is much better performed hereby, than by adminiſtring the metal in any other form.

CHAP. II.

Of MINERAL WATERS peculiar to ENGLAND.

HAVING taken a general ſurvey of medicated Mineral Waters, in the preceding Chapter, we ſhall in this confine ourſelves to thoſe only, which are peculiar to England: We ſhall relate the chemical trials, which have been made to find out their virtues, and the good effects which they have been experienced to produce in the conſtitution.

It is uſual to give an account of their contents, after the evaporation of the water; but this is not ſufficient in all caſes, becauſe there is often a volatility, when juſt taken from the ſpring, wherein the principal ſtrength of the water reſides, and which is loſt if not immediately drank. Hence it follows, that the nature of the contents will not always aſcertain the virtues of the waters. However, in recounting the effects and properties of theſe waters, all the circumſtances will be taken notice of, that may tend to give an inſight into their operations; and that each ſpring may be more readily found, we ſhall place the counties in which they ariſe in an alphabetical order.

BERKSHIRE. In this county we meet with but two Mineral Waters, one at Sunning-hill in Windſor-Foreſt, which is of the ſame nature as the Tunbridge waters; and the other at Comner, or Cumner, three miles weſt of Oxford. This laſt water is always of a whitiſh colour, eſpecially in the ſummer time when the well is low; the reaſon of which appearance is ſaid to be owing to its proceeding from lime-ſtone. Oil of Tarter being dropt therein, cauſes it to let fall a white ſediment; and Spirit of Hartſhorn turns it to a pearl-colour; but with the Solution of Silver it turns to a purpliſh pearl-colour, and with Syrup of Violets, green. A gallon of this water will yield 296 grains of ſediment, whereof 76 grains are lime-ſtone, and the remainder a calcarious nitre. The ſediment is dark brown, with a ſaltiſh and very bitter taſte; will ferment with Vinegar, as well as with Oil of Vitriol, and will turn green immediately with Syrup of Violets. The ſalt itſelf is of a yellowiſh brown, and has a ſaltiſh, nauſeous, bitter taſte. It is a kind of calcarious nitre, but inclines more to an alcali than moſt others of this claſs. A quart of it will purge a robuſt country fellow.

CORNWALL. The mineral ſprings in this county have never been taken notice of till very lately, and that by Mr. Borlace, in his Survey of Cornwall. Madern Well is only a ſpring of pure water, which riſes in the pariſh of Madern, four miles weſt of Penzance. However, it is reſorted to by many people that are afflicted with pains, aches, and ſtiffneſs of the limbs; and it has done many cures, which may be only owing to the coldneſs and purity of the ſpring. Euny Well, once ſo famous, ſtill preſerves its reputation for drying up humours, and healing wounds and ſores. However, as this has no evident mineral impregnation, theſe effects may be owing merely to the coldneſs of the water, which braces up the nerves and muſcles, and ſtrengthens the glands. Here is another well of this ſort, called the Holy Well, which is about a mile and a half to the north-weſt of St. Cuthbert's church, in a cave that lies in a ſmall ſandy bay. In this cave, there are ſtones like iſicles, that hang from the roof, and the floor of the rock is covered with the ſame ſubſtance. This water will not change the colour of green tea, nor curdle milk; from whence it is concluded, that it has neither alum nor ſteel in its compoſition. When this water is evaporated, it will depoſit a ſmall ſediment, of the ſame colour and ſubſtance with the incruſtations: it will neither melt nor flame, nor has it any particular taſte or ſmell, and yet is in great uſe for fluxes and diſorders of the bowels.

The moſt remarkable Chalybeate Spring in Cornwall riſes in the tenement of Colurian, in the pariſh of Ludgvan. The bed through which this water runs is full of an ochreous, iron mineral, from which its taſte and ſmell proceeds. It turns to a deep reddiſh purple with Galls, and with Oak-leaves it becomes of a bluiſh black, but has a purpliſh caſt. When a thimbleful of Oil of Tarter was dropped into this water, it fell immediately to the bottom of the glaſs, which held about half a pint: but it precipitated no ſediment, nor made any change in the water; only the colour was more inclinable to that of a bright oker, but was ſcarcely diſcernible. It will not turn ſilver black, and therefore it is concluded there is no ſulphur in it; but in the morning, before the water is ſtirred, there is a film on the ſurface with all the colours of the rainbow, ſhooting to and fro, which occaſions ſome to think, there is a naptha in the water. It will mix with milk, and lathers readily with ſoap; and after it has ſtood 24 hours in the open air, it undergoes no alteration from Galls, which is owing to the flying off of the volatile ſpirit. The virtues of this water are very great; for perſons have been cured of the King's Evil, by drinking it, and waſhing the parts affected, whom Mr. Borlace knew; and he heard of many others that were cured in the ſame manner. It is very diuretic, promotes perſpiration, opens obſtructions of the bowels, and reſtores a loſt appetite. It alſo cures ſores of every kind, and is a very good eye-water.

CUMBERLAND. At Stanger in this county, two miles ſouth of Cockermouth, and three weſt of Keſwick, there is a ſpring of clear ſaltiſh water, with the taſte and ſmell of iron; it turns white with Spirit of Hartſhorn, and lets fall a great ſediment with Oil of Tartar: a gallon of this water will yield 1170 grains of ſediment, whereof 1080 are ſea-ſalt, and the reſt lime-ſtone. It is white, hot on the tongue, and grows very moiſt in a damp air. There is a little mixture of nitre with the ſea-ſalt, but this laſt predominates, and is joined to a conſiderable quantity of iron. Four or five pints will purge upwards and downwards; but it is an excellent remedy in ſurfeits, pains in the ſtomach and breaſt, the

green-

green-ſickneſs, ſcurvy, ſores, and breaking out of the ſkin.

DERBYSHIRE. Buxton Well lies at the bottom of a dirty village of the ſame name, and there is a large commodious houſe, to which much good company reſort in the ſummer time. The water is neither ſo hot as that of Bath, nor ſo cold as that of Briſtol. It has a ſweet, pleaſant taſte, and a gallon will yield about 20 grains of a ſediment, which conſiſts chiefly of lime-ſtone, ſea-ſalt, and a little calcarious nitre. It depoſits a white ſediment with Oil of Tartar; but it will not turn ſilver black, nor does it diſcover any ſigns of ſulphur. It will not ferment with Spirit of Vitriol, nor turn green with Galls, till they have ſoaked four days therein. It is a temperate bath, and a very light water. It is of a relaxing, diluting, ſweetening and attenuating nature, and will open obſtructions of the ſmalleſt veſſels. It is good in conſumptions, for hot ſcorbutic humours, and all fluxions and bleedings, as well as in hypocondriacal and hyſterical caſes. It is of great uſe in the regular gout, in rheumatic and ſcorbutic pains, in vomiting of blood, and in all kinds of fluxes. It is good in internal inflammations, conſumptions, the diabetes, and a bloody urine; as alſo in a bilious cholic, want of appetite, and in cold ſtomachs from hard drinking. To theſe may be added, contractions, cramps, convulſions, St. Anthony's fire, and all breakings out of the ſkin.

Matlock Bath is alſo in Derbyſhire, near Warkſworth, and ten miles north by weſt of Derby. The village is ſeated on the very edge of the river Derwent, is a very beautiful place, and is frequented by very polite company. The water of the bath is not ſo hot as that of Briſtol, and it curdles with ſoap. It depoſits a white ſediment with Oil of Tartar, and the ſame experiments give the ſame appearances as in Buxton water. A gallon of water yields 40 grains of ſediment, whereof 13 are ſalt, conſiſting of nitre and ſea-ſalt; and the remainder is a rough, white, alcaline earth. The virtues of theſe waters are nearly the ſame as thoſe of Buxton and Briſtol, uſed either internally or externally. Both drinking and bathing are generally thought good for the cancer and the king's evil. Bathing is proper for rheumatiſms, ſcurvy, and defedations of the ſkin. It is alſo uſed ſucceſsfully in all ſorts of bleedings, as well as hectic fevers and inward ulcers, with a milk diet. It alſo cures the diabetes, and the bilious cholic.

Weſtwood is another village in this county, near Tanderſley, where there is a ſpring, which ſeems to be a ſolution of the pyrites, that generally attends pit-coal. It turns blue with Galls, and the ſalt ſeparated from the earthy part of the ſediment will ſhoot into beautiful cryſtals of vitriol, without any other ſalt. The water will cure ſtubborn ulcers, and particularly healed one in a maid-ſervant that was very frightful: it was waſhed twice a day with this water, and was cured in three months.

DORSETSHIRE has only one mineral water hitherto taken notice of, and this is at Nottinton, a village near Weymouth. The water has a ſtrong ſulphureous ſmell, with a flavour reſembling that of boiled eggs, and the colour in a tin veſſel is blue. At the fountain head a ſhilling put into this water, becomes of a gold colour in two or three minutes; and from various experiments it appears to be impregnated with ſulphur and natron. It is remarkable for curing foulneſſes of the ſkin, by internal uſe.

DURHAM. Hartlepool is a market-town in this Biſhopric, 15 miles ſouth-weſt of Durham. The water found here is a chalybeate, though as it riſes it diſcovers a little ſteel and ſulphur, which ſoon flies off after it is taken up. It lets fall a white ſediment with Salt of Tartar, becomes whitiſh with Spirit of Hartſhorn, and turns of a pink-colour with Galls; but green with Syrup of Violets. A gallon yields 120 grains of ſediment, whereof two parts are nitre, one ſea-ſalt, and the reſt lime-ſtone. The water is an excellent antiſcorbutic, and cures habitual cholics. It is good in pains of the ſtomach, in indigeſtion, in the gravel, in women's obſtructions, in hypocondriac melancholy, in the cachexy, in weakneſſes of the back, hectical heats, and recent ulcers.

ESSEX. Here are ſeveral mineral waters in this county, of which one is at Upminſter, ſeven miles ſouth of Burntwood, and eight eaſt of Barking. The water is bitter, and will curdle with Oil of Tartar, but more ſtrongly with Spirit of Hartſhorn, and will not lather with Soap. A ſolution of Alum cauſes it to let fall a large grumous ſediment, and the ſolution of Copperas changes it to a dark dun colour. It appears to be a ſulphureous water, of a conſiderable ſtrength, and a gallon will yield 332 grains of ſediment, which is of a nauſeous bitter taſte. It is chiefly a calcarious nitre, mixed with a little natron and ſea-ſalt. The water is purgative and diuretic, abſorbs acidities, ſtrengthens the ſtomach, and checks vomiting.

Witham Water, when freſh, is perfectly clear, and has a very ſtrong chalybeate ſmell and taſte. It has a remarkable freſhneſs when juſt taken from the ſpring, which renders it agreeable to the taſte and ſtomach; but, after it had ſtood awhile, it loſes that quality, and depoſits a browniſh ſediment. A gallon, by evaporation, will yield 30 grains of ſediment, which will grow damp in a moiſt air. However, this water is of no uſe, unleſs it be drank immediately at the ſpring, and then it is diuretic, and is good in hectic fevers, lowneſs of ſpirits, weakneſs of the nerves, and want of appetite. Witham is a market-town, which lies in the road between Chelmsford and Colcheſter.

Tilbury is a village, ſeated over-againſt Graveſend in Kent; the water here is ſomewhat of a ſtraw-colour, and has a ſoft ſmooth taſte. With Oil of Tartar, it will cauſe no immediate precipitation, though it will curdle with Soap, but not with Milk. A gallon will yield 180 grains of ſediment, of a yellowiſh brown colour, with a ſharp taſte, like that of a fixed alcali. A quart of this is a middling doſe; it generally paſſes off by urine and perſpiration. It warms the blood, is good in lowneſs of ſpirits, and is a ſpecific in looſeneſſes. It alſo cures almoſt all fluxes of blood, and is particularly good in an acidity of the ſtomach, and for ſome kinds of ſcurvies.

FLINTSHIRE is in North Wales, and Caergile, in this county, is about ſeven or eight miles ſouth by weſt of Cheſter. The water found here is as clear as cryſtal, and yet it will turn whitiſh with Oil of Tartar; it alſo turns green with Syrup of Violets, and red with Logwood. A gallon will yield 220 grains of ſediment, of which 66 are earth, and 154 are ſea-ſalt and lime-ſtone. It appears to be impregnated with calcarious nitre and ſea-ſalt, and, if drank to a quart or two, will purge pretty well. It has cured a woman that had a loathſome ſcurf all over her body, by drinking three pints of this water in a day. Likewiſe ſeveral children afflicted with ſcorbutic diſorders, and the leproſy, have been cured by drinking and waſhing.

GLOUCESTERSHIRE has but one remarkable water, which is at Cheltenham, a town which lies in the road from Glouceſter to Warwick. It was not much taken notice of before the year 1740, and then it was ſaid to be the beſt purging water in England; but it begins now to be neglected. It is limpid, a little brackiſh, and nauſeouſly bitter. It will curdle with Soap, and lets fall a white, grumous ſediment with the ſolution of Salt of Tartar, and

and with the Spirit of Sal-Ammoniac. It will ferment with Oil of Vitriol, Spirit of Salt, and Vinegar: beef and mutton boiled therein will become of a pale red, and it turns a deep green with Syrup of Violets. A gallon will yield 688 grains of ſediment, which contains a little impalpable earth, mixed with a little ſalt, which is chiefly calcarious, and has a nauſeous bitter taſte. The doſe is from one pint to three or four, nor is it ever attended with gripes, but creates a keen appetite. It has been uſed with ſucceſs in the gravel, and will cure old ſcorbutic humours, St. Anthony's fire, and ſtrumous inflammations of the eyes.

GLAMORGANSHIRE is in North Wales, and at Swanſey, a ſea-port town, there is a ſpring that has an acid ſtiptic taſte like alum, though the predominant ſalt is a martial vitriol. It turns blue with Vinegar, and will not curdle with Milk. A gallon of this water yields 40 grains of ſediment, of a highly acid, ſtiptic, vitriolic taſte, and a light brown colour, which will ferment with Spirit of Hartſhorn and Oil of Tartar. It is good in looſeneſſes, and will ſtop the bleeding of external wounds.

HERTFORDSHIRE has two medicinal ſprings, at Barnet and Northall. The firſt is called Eaſt Barnet, and is ſituated two miles ſouth-eaſt of High Barnet. Northall lies three miles north of High Barnet, and receives its name from Northaw, which is the ſame as North-grove, there having been a wood here belonging to the monaſtery of St. Alban. Both the waters ſeem to be of the ſame nature; that at Northall is a little brackiſh and bitteriſh in the throat; but is not ſo nauſeous as that at Epſom. Barnet water is bitterer than the former, but they will both curdle with Soap, and let fall a grumous ſediment with Oil of Tartar. With a ſolution of Alum they will let fall white grumes, which experiment ſhows they are not aluminous; but with Galls they turn of a wheyiſh colour, and with Logwood of a deep red. A gallon of Northall water will yield four drachms and twelve grains of very white ſediment; and a gallon of that at Barnet, 20 grains of a brackiſh, bitter ſediment. From other experiments it appears, that both theſe waters contain calcarious nitre, with a ſmall mixture of ſea-ſalt, and a little lime-ſtone. They have both a purging quality; but they are not half ſo ſtrong as that at Epſom.

KENT has a remarkable mineral water, commonly known by the name of Tunbridge Wells, which is 34 miles ſouth-eaſt of London. In a warm ſeaſon a gas of vitriol may be perfectly diſtinguiſhed in this water; and it is generally allowed to be impregnated with volatile and ſpirituous exhalations. It turns of a blackiſh purple colour at the fountain-head with Galls, Oak-leaves, and Green Tea; but if a few drops of Spirit of Vitriol be added thereto, it will become clear again. In a rainy ſeaſon in January, a gallon will yield nine grains of ſediment; but in Auguſt no more than ſix grains. It is a light, and comparative pure chalybeate, and its virtues are moſt powerful at the fountain-head. It cauſes a blackiſh perſpiration, which in time will change the linen of the drinkers to the ſame colour. It purges moſt by ſtool and urine; but if the ſtomach be foul, by vomit. In general, it is an effectual remedy in obſtructions of the glands of the meſentery, as well as in recent dropſies, as alſo in phlegmatic patients, whoſe blood is very poor. It is good in all pains, and ſwellings at the pit of the ſtomach, though of many months ſtanding. It is excellent in ulcers of the kidnies and bladder, and cures the cholic, vomiting, and the hiccough; it likewiſe kills worms. It ſtrengthens the brain and nerves, and is good in convulſions, the head-ach, and vertigo; beſides, it cures long and tedious agues, and is good in the dropſy, black and yellow jaundice, hard ſwellings of the ſpleen, the ſcurvey, and green-ſickneſs, as well as helps ſore eyes and red pimples.

Sydenham Wells are in the pariſh of Lewiſham, and are ſeated upon a common near Dulwich in Surry. The water is a little bitteriſh, will curdle with Soap, and, with the ſolution of Pot-aſhes, it will let fall a white grumous ſediment. From theſe, and other experiments, it appears to be impregnated with a calcarious nitre and ſea-ſalt, joined to a little natron and calcarious earth. A quart will yield above a drachm of a paliſh yellow ſediment, with a nauſeous, bitter taſte; and the ſalt ſeparated therefrom has the ſame taſte, with a little brackiſhneſs. It produces much the ſame effects as Epſom water, though it is not half ſo ſtrong.

Dulwich water has its name from riſing in the hills nearly adjoining to that village in Surry; but in reality it is in the pariſh of Lewiſham, in the county of Kent. The water is generally clear, has a brackiſh taſte, with a little bitterneſs in the throat, and will curdle with Soap; but with Oil of Tartar it will let fall a white grumous ſediment. A gallon will yield three drachms of ſediment of a greyiſh colour, and a brackiſh taſte, which will ferment greatly with Oil of Vitriol. This water is chiefly impregnated with ſea-ſalt, calcarious nitre, and a little calcarious earth. It is a briſk purge, and will cure ulcers of every kind, by bathing therein, all defedations of the ſkin, and even leproſy itſelf. It is good in obſtructions of the bowels, in the green-ſickneſs, black and yellow jaundice, the cholic, gravel, piles, cachexy, ſcurvy, and removes difficulty and ſharpneſs of urine, as well as ſtrengthens the brain and nerves. The doſe is three pints a day at firſt; but ſhould be increaſed every day till it come to eight or nine pints.

LANCASHIRE has ſeveral mineral ſprings, among which is Carlton Water, ſo called from Carlton, a village ten miles ſouth-weſt of Preſton. This water is ſomewhat of a chalybeate, and when juſt taken up has a faint ſmell of ſulphur. It will curdle with Soap and Milk, turns white with Oil of Tartar, has a pink ſediment with Galls, and changes to a deep blue with Logwood. A gallon contains 236 grains of a white ſediment, whereof one third part is earth. The ſediment is of a brackiſh taſte, and bitteriſh in the throat, and will ferment with acids. The ſalt is alſo brackiſh, very bitter in the throat, and emits an acid fume with Oil of Vitriol; but will not ferment nor change with Vinegar. It is a more powerful abſorbent than many other nitrous waters, and three or four pints will purge briſkly.

Rougham Water, ſo called from Rougham, a village in Lancaſhire, two or three miles from Cartmel. The ſpring riſes from the bottom of a rocky mountain, and the taſte of the water is a little brackiſh: it turns white with Oil of Vitriol, green with Syrup of Violets, and brown with Logwood; but it continues clear with Galls. A gallon of this water yields 300 grains of ſediment, of a ſaltiſh taſte, will ferment with Oil of Vitriol, and emit an acid fume. The water purges briſkly by ſtool and urine, and the common people drink it from three to eight quarts. It is of great uſe in bad digeſtions, loſs of appetite, and the ſcurvy. It has cured the jaundice and a quartan ague, and is excellent in the green ſickneſs.

Crickle Spa riſes in a village of that name, a mile from Broughton. It has a ſtrong fœtid ſmell, and will turn ſilver black in a minute. The earth it runs over is of a ſhining black, and yet it will turn rags, leaves, and graſs, white. A gallon contains 320 grains of ſediment, 12 of which are earth, and the reſt are ſea-ſalt and nitre. It is a purging, ſulphureous water.

Heigh is a village not far from Wigan, where there is a water, which will ferment ſtrongly with any alcali, will turn inky with Galls, and has likewiſe a vitriolic taſte; a gallon yields four ounces of ſediment, which conſiſts of a variegation of white and green, with ochre, ſulphur, and a little copper. It works plentifully by vomit and ſtool, and will ſtop any internal bleeding.

Burnly is a town alſo in Lancaſhire, whoſe waters will turn Galls of a deep red in a moment, and with Syrup of Violets to a very deep green. It works powerfully by urine, and is good in ſcorbutic caſes.

Handbridge is ſeated between Burnly and Townly, which has a ſpring that changes Galls to a faint orange colour. The ſalt obtained therefrom yields a fœtid, penetrating ſmell with ſalt of tartar. Theſe two laſt Waters agree with the Pohun at Spa, in containing iron and natron as their principal ingredients. It purges by ſtool and urine, and is of great uſe in the gravel, ſcurvy, obſtructions, and diſeaſes from an acid.

At Ancliff, a village three miles from Wigan, there is a Spring called the Burning Well, which will take fire by holding a lighted candle near it. It will continue a whole day, and eggs and fleſh may be boiled therein; but the water itſelf is cold. It is but a few yards diſtant from a rich coal mine, which renders it probable, that the inflammable vapour is rock oil.

There is a Spring two miles from Whaley, ſeven miles weſt of Burnly, whoſe ſtream renders Gold brighter; but turns all white metals black. The channel this water runs in is lined with a bituminous, ſtinking ſubſtance, and it is ſtrongly impregnated with ſulphur, combined with a little calcarious nitre, a mixture of ſea-ſalt, and of abſorbent earth; but we have no account of its virtues.

Inglewhite is a village in Lancaſhire, where there is a ſtrong, ſulphureous and chalybeate water, which is the product of marle. This partly reſembles ſlate, will moulder, when expoſed to the air, into exceeding thin flakes, like leaves of fine paper, and will afterwards turn to a black powder. A gallon contains 24 grains of ſediment, of which 19 are earth and ochre, and 5 nitre; but it will not purge unleſs drank with ſalt.

LEICESTERSHIRE has one remarkable mineral Spring at Nevil Holt, a village ſeated to the ſouth of Market Harborough: the water is exceeding fine and clear, and it has a ſtyptick, bitter, ſweetiſh and ſubacid taſte, leaving the mouth ſomewhat dry. It is uncommonly briſk and ſharp, when drank at the Spring-head; and then alſo it paſſes quicker than elſewhere: it curdles with Soap, and lets fall a groſs, white ſediment with oil of Tartar; but with a ſolution of Alum and Copperas, it will continue clear. Hence, and from other experiments, it appears to contain a calcarious nitre and alum, with a fat clay, a latent ſulphur, and ſometimes a little ochre. It will cure externally freſh wounds, and all ſorts of ulcers; and is excellent for the eyes: uſed outwardly, and taken inwardly, it will cure hectic ulcers. When taken inwardly, as an alternative, an ounce or two may be taken five or ſix times a day, or four ounces night and morning; but when deſigned as a purge, it muſt be taken from one pint to three. If the conſtitution is cold and phlegmatick, it will be neceſſary to add four ſpoonfuls of brandy, and an ounce of ſugar to each bottle of water. It is excellent in bloated, dropſical conſtitutions: it has no parallel in all ſorts of hæmorrhages, as well as in all great and natural ſecretions, of what kind ſoever. It alſo cures an inflammation of the lungs, attended with a cough and ſpitting of blood. It is very ſucceſsful in the King's Evil, hidden cancers, as well as ſcrophulous inflammations of the eyes of many years ſtanding. It alſo cures all diſeaſes of the ſkin, and has had ſurprizing ſucceſs againſt rheumatiſms; but it muſt not be drank in the increaſe and height of any internal inflammation.

LINCOLNSHIRE has ſeveral mineral ſprings, whereof one is at Cawthorp, a village ſeven miles north-eaſt of Stamford, where the ſpring riſes up in a large baſon, in the middle of the ſtreet. It will turn very white with Oil of Tartar, and afterwards let fall a yellow ſediment; but it will turn green with Spirit of Hartſhorn. A pint will yield a ſcruple of a white ſediment, whereof near one half is ſalt, and the other earth. It is a purging chalybeate, and is probably a great corrector of acidity.

In the pariſh of Strenfield, ten miles eaſt of Lincoln, there is a water that is pleaſant and ſweet to the taſte; but will curdle with Soap, and turns to a pearl colour with Oil of Tartar. A gallon of it contains four ſcruples of a white ſediment, whereof 44 grains are earth, 30 nitre, and 8 ſea-ſalt. It is found effectual in curing obſtinate fluxes, and the diabetes; as alſo all internal hæmorrhages, and profuſe night ſweats.

Gainſborough is a market-town in Lincolnſhire, ſeated on the river Trent, 14 miles north-weſt of Lincoln. The ſpring riſes to the ſouth-eaſt of the town, and ſmells and taſtes like ſteel and ſulphur. A gallon yields 192 grains of ſediment, whereof 120 are earth, and 72 calcarious nitre: it has ſomewhat of a purgative quality.

MIDDLESEX contains ſeveral mineral waters, of which one is at Acton, a large village, eight miles weſt of London, which is a purging water, though it is very clear and without ſmell. The taſte is a little nauſeous, like a weak ſolution of Epſom ſalt: it will curdle with Soap, and with Salt of Tartar it produces a white grumous cloud. Oil of Vitriol and Spirit of Salt will excite a ſmall fermentation, and with Syrup of Violets it will turn to a light green. A gallon will yield 344 grains of ſediment; it is very white, and of a nauſeous bitter taſte; it will ferment very briſkly with Spirit of Salt, and the proportion of the ſalt to the earthy matter is as 73 to 4: from other experiments it appears, that this water is chiefly impregnated with a calcarious nitre, and a ſmall proportion of abſorbent earth. It is accounted one of the ſtrongeſt purging waters near London, and is noted for cauſing a great ſoreneſs *in Ano*.

Pancras lies on the north-weſt ſide of London, and in the road to Kentiſh-town; the water here has ſcarce any taſte, till one half is evaporated, and then it becomes bitter; with Oil of Tartar it will depoſit a copious white ſediment; but with the ſolution of Alum there will be a ſmall grumoſity. Acid ſpirits will produce a ſmall fermentation; and with Syrup of Violets it will turn green. A gallon will yield five drachms of whitiſh ſediment, which has a ſaltiſh and ſtrongly bitter taſte in the throat: from hence it is concluded, that the impregnating ſalt is a calcarious nitre, and it is conſiderably diuretick, and ſomewhat purgative.

Shadwell Water is found in the Sun Tavern Fields, about two miles eaſtward of the Tower of London, and about half a mile from the river Thames. It is of an amber colour, with a ſtrongly acid and ſtyptic taſte. It ferments for ſome time with Oil of Tartar, and lets fall a large ochreous ſediment; but with the ſolution of Alum it continues clear. It will turn a copper half-penny black on the ſurface, and a knife black, blue, and ruſty. A gallon contains 1320 grains of a white and yellowiſh ſediment, which has a highly acid and auſtere taſte. The predominant ſalt of this water is highly acid and vitriolic, with a combination of ſulphur. This water has been chiefly uſed externally; but if a pint of it be

be uſed at twice, in the ſpace of an hour, it will produce a gentle vomiting, and two or three ſtools: it has done a great deal of good in all diſeaſes of the ſkin; and ſome ſay it will cure fiſtulas, ſtubborn ulcers in the legs, and ſore eyes, by dipping linen rags in the water, and applying them to the parts affected: taken inwardly, it ſtopped internal bleedings, and has perfected the recovery from camp dyſenteries.

Hampſtead is well known to be a large village, or rather town, five miles north of London; and the water that is found there was formerly in as great reputation, as that at Tunbridge. It will lather with Soap, but undergoes no alteration with Spirit of Hartſhorn; and yet it will ferment with Oil of Vitriol, and grow warm and ſmoak. It will keep milk ſweet for four days, and will turn purple with Syrup of Violets; likewiſe with half a grain of Galls grated, it will turn of a fine deep purple. A gallon will yield about five or ſix grains of a kind of ſaline concretion, mixed with a yellowiſh earth, that will taſte ſomewhat like vitriol of ſteel. It works chiefly by urine, and has been found good in want of appetite and indigeſtion: it is alſo good in vomitings, cholicks, nervous, and hyſterical diſorders, raiſing the ſpirits greatly. It is ſerviceable in the fluor albus, in weakneſs from miſcarriages, and in the ſcurvy and all diſeaſes in the ſkin: it is proper in obſtructions of the meſentery, bladder and ſkin; and alſo in ſome paralytic diſorders.

New Tunbridge-Wells are near the New-River-Head, at the entrance of Iſlington, on the ſide next London. The water has the taſte of iron, and is a little ſtyptic, with ſome degree of quickneſs both in ſmell and taſte, eſpecially in the ſummer ſeaſon. It will lather with Soap, and turn a little milky with a large proportion of Oil of Tartar; but it will not let fall any ſediment with volatile alcalies. A gallon will yield from 10 to 30 grains of a reddiſh earth, which will ferment with Oil of Vitriol. It is a light and comparatively pure chalybeate, of conſiderable ſtrength at the fountain head, where it ought to be drank. It is of great efficacy in all nervous diſorders, and reſtores the ſtrength after violent acute diſeaſes: it opens all obſtructions in women, and is excellent in a dropſy; in which caſe the doſe is from half a pint to a pint, and no more. It opens obſtructions of the glands, and is of ſome ſervice in reducing corpulent habits.

NORFOLK has but one remarkable mineral Spring, which is at Thetford, a market town of great antiquity: the water appears to have ſomewhat of iron; for Galls will turn it firſt purple, and then black. It will let fall ſpontaneouſly a drachm of an earthy ſubſtance of the colour of ochre, which being calcined in a crucible, ſome of its particles may be attracted by a loadſtone. From other experiments, it appeared to be impregnated with iron, ſulphur and natron; it works gently by ſtool and urine, and ſharpens the appetite: it reſtores loſt ſtrength, and cures pains of the ſtomach, and of the head, as well as fainting, vomiting, convulſions, and indigeſtions, difficulty of breathing, and the beginning of a conſumption; it alſo kills worms.

NORTHAMPTONSHIRE has three mineral Springs, whereof one is at King's-cliff, eight miles ſouth of Stamford, and it both ſmells and taſtes of iron. It will let fall a white ſediment with Oil of Tartar, and with Galls it precipitates a purple ſediment; but turns of an opake red with Logwood, and of a deep green with Syrup of Violets. A gallon yields 140 grains of ſediment, 75 of which are limeſtone and ochre, and 65 a calcarious nitre. From various experiments it appears, that this water is of a chalybeate, laxative nature, impregnated with iron and calcarious nitre, with a ſmall quantity of ſea-ſalt, and a calcarious earthy ſubſtance. It will not purge a ſtrong perſon, unleſs he drinks from three to five quarts; but it has been uſed with great ſucceſs, in diſorders from obſtructions, and in eruptions of the ſkin; it has alſo cured ſeveral lame perſons.

Aſtrop is a village in this county, four miles ſouth-eaſt from Banbury in Oxfordſhire; and the mineral water here is a briſk, ſpirituous, clear and well-taſted chalybeate. It lets fall a white ſediment with Oil of Tartar; and a gallon, after evaporation, yields 17 grains of ſediment, containing nitre and calcarious earth. Drank at the fountain head, it is a certain cure for all female obſtructions, and in the firſt and ſecond ſtages of conſumptions. It ſeldom fails in the jaundice and beginning of a dropſy, and reſtores a conſtitution weakened by hard drinking: the doſe is very large, that is, from three quarts to five in the fornenoon; and ſome affirm it will cure madneſs and melancholy.

In the pariſh of King's-Sutton four miles ſouth by eaſt of Banbury in Oxfordſhire, there is a mineral Spring, that has an intolerable ſtrong ſmell like rotten eggs; but the taſte is ſaltiſh, warm and pungent, like Salt of Tartar. A gallon yields 166 grains of ſediment, of which 9 are earthy, and the reſt ſalt, of a pungent, brackiſh and bitter taſte, with all the characteriſtics of an Alkali. It is a purging water, ſtrongly impregnated with ſulphur, and an alcaline ſalt mixed with ſea-ſalt. It is famous for diſcuſſing and healing of tumours, ulcers, and all diſeaſes of the ſkin.

NOTTINGHAMSHIRE has a mineral Water at Kinalton, nine miles ſouth-eaſt of Nottingham. It is clear, pleaſant, cooling, and a little ſaltiſh; it grows white and curdles with Oil of Tartar; but undergoes no alteration with acid ſpirits, and will turn of a beautiful light red with Tincture of Logwood. A gallon will yield 280 grains of a beautiful white ſediment, the fourth part of which is a fine alkaline earth; and in the remainder is a remarkable pure, clear nitre. This is a purging water, that has not above half the portion of contents as Epſom water, nor will it work unleſs drank plentifully.

At Orſton, 12 miles eaſt of Nottingham, there is a mineral Water, which, as it riſes out of the ſpring, has a ſweetiſh chalybeate, and a little roughiſh taſte; but, when it has ſtood for ſome time, it becomes rough and harſh. A gallon yields 128 grains of ſediment, of which the portion of the earth to the ſalt is as 27 to 9. The Water is a rich chalybeate, with a conſiderable quantity of ſulphur, if drank as it ſprings up; but the predominating ſalt is a calcarious nitre, mixed with a ſmall quantity of ſea-ſalt. It will purge thoſe of a groſs habit of body, and will turn the throat, tongue, and ſtools of the drinkers, perfectly black. It is good in the hypochondriac melancholy, ſcurvy, want of appetite, indigeſtion, pain of the ſtomach, coſtiveneſs and ſtoppage of urine. It is alſo good in the beginning of obſtructions of the bowels, and likewiſe in ulcers of the lungs, and ſpitting of blood.

In OXFORDSHIRE is Chadlington Water, in a village of that name, three miles ſouth of Chipping Norton. It ſmells like the waſhings of a foul gun, and a gallon yields 90 grains of ſediment, of which 7 are earth, and the reſt a peculiar ſort of nitre. From other experiments it is found impregnated with ſulphur, and an alkaline ſalt mixed with ſea-ſalt: it is accounted a purging water.

Clifton is a village two miles eaſt of Doddington, where there is a clear water that affords a ſediment, which yields a peculiar kind of nitre, inclinable to an alkali. It is laxative, and is uſed to cure diſeaſes of the ſkin in men and cattle, by bathing therein.

Doddington is a ſmall market-town 16 miles north of Oxford, where there is a ſtrong ſulphureous water,

ter, that ſmells like the waſhings of a foul gun. A gallon yields 87 grains of ſediment, whereof 44 are earth, and 43 ſalt. It is impregnated with ſulphur and iron, both of which are very volatile; beſides which, it has ſalt enough to give it a purgative quality.

RADNORSHIRE, in South Wales, has very remarkable mineral Waters at Llandridod, which is 24 miles weſt of Lempſter in Herefordſhire. Here there is a common ſix miles long and three quarters broad, and in that part of it lying in the above pariſh are the mineral Springs. Theſe are the ſaline pump-water, the ſulphureous water, and the chalybeate rock-water. The air is exceeding healthy, inſomuch that weak and conſumptive people, that come here to drink the waters, ſoon revive and gather ſtrength. Theſe Springs are now frequented by very genteel company, and in the ſummer time the common people reſort here in crowds.

The Rock-water is ſo called, becauſe it iſſues out of a rock, and a glaſs of it taken up in a clear warm day, is as bright as cryſtal; but after it has ſtood ſome time, it changes to a pearl colour. While it continues clear it has a ſtrong chalybeate taſte and ſmell, but they forſake it as it changes colour: at the ſpring head, it turns to a deep purple with powder of Galls, and becomes hot with Oil of Vitriol. However, it will not curdle Milk; but with Oil of Tartar it becomes as white as milk, which afterwards changes to a yellowiſh green. It preſerves its tranſparency with acid ſpirits; but with Sugar of Lead it turns firſt milk white, and at length lets fall a yellowiſh grey ſediment, from a quart of water, which after it has been analyſed, is found to contain about 15 grains of crocus of iron, and about 5 of the bituminous mucilage of iron. From hence, and various other experiments, it is concluded, that this water contains iron, ſalt, ſulphur and vitriol. It is good in all chronick diſtempers proceeding from a laxity of the fibres, particularly in ſcorbutic eruptions and weakneſs of the nerves, and diſorders proceeding from the brain. It is alſo efficacious in obſtinate agues, obſtructions of the bowels, ſlow nervous fevers, and in all female diſorders.

The ſaline purging water is called upon the ſpot the Pump-water, and from various experiments it appears to contain a neutral ſalt like native borax, a ſmall quantity of bitumen, and an etherial, elaſtick, volatile mineral ſpirit, and a mineral oil. It is excellent in all diſeaſes of the ſkin, and in ſuch diſorders as proceed from corrupt humours: but if the diſeaſe is obſtinate, it requires ſome time to cure it radically. Perſons troubled with the ſcurvy, muſt uſe the water both as a purgative and alterative; and, for the laſt, a pint and a half ſhould be taken at three doſes, in the morning before breakfaſt. As a purge, half a pint muſt be drank at a time, till it begins to work. In diſeaſes of the ſkin the patient muſt bathe frequently, and waſh the parts affected with the water, and particularly in the leproſy, ſo much water muſt be drank, as to cauſe two or three motions every day; to which muſt be joined bathing twice a week in a warm bath, made with equal quantities of the pump and ſulphureous waters. In the gravel, the patient muſt drink ſo much as will give him two or three ſtools, and when the gravel is diſcharged by this means, the patient muſt drink every morning half a pint of the rock water, and half a pint of the pump-water; alſo half the quantity going to bed.

The Sulphureous Water, commonly called the Black ſtinking Water, has its name from the ſtrong ſmell, and the blackneſs of the channel through which it paſſes. It ſmells like the waſhings of a foul gun, and has the ſtrongeſt ſmell in rainy weather. From various experiments, it appears to contain etherial, volatile, mineral ſpirits, a ſmall quantity of a vitriolic acid, a mineral, unctuous mucus, a fine mineral oil, a ſubtle crocus, a perfect ſulphur, and a neutral ſalt, of a briny, calcarious nature. It is of great uſe in all caſes, where bathing is proper, made into a luke-warm bath. It is excellent in benumbed limbs, in waſting of the fleſh, and in nervous diſorders; as alſo in old ſores, tetters, and in all diſeaſes of the ſkin; as well as in the ſtone, gravel, rheumatiſm, and gouty diſtempers. Drank inwardly, and uſed outwardly, it cures the King's Evil, and is an excellent abſorbent, inſomuch that it is efficacious in ſoreneſs of the ſtomach, obſtructions of the liver, and in the jaundice: it is alſo good in contractions and weakneſſes of the limbs, and in broken conſtitutions from hard drinking. The doſe cannot be determined, and therefore it is beſt to begin with drinking from a pint to a quart in a morning, that is, about half a pint at a time, with ſhort intervals between the draughts: the quantity may be increaſed to as much as the conſtitution will well bear, that is, as much as will ſit eaſy on the ſtomach, and paſs off well.

SOMERSETSHIRE is remarkable for having two of the moſt noted mineral Waters in the kingdom, thoſe of Briſtol and Bath, beſides others of different kinds: that at Briſtol iſſues out of a rock, and in that city is called the Hot-well Water. It is ſeated on the north ſide of the river Avon, where there is a romantic and beautiful proſpect. When firſt drawn off, it is of a whitiſh colour, at leaſt ſometimes, which it loſes gradually as it grows cold, and many ſmall bubbles ariſe in it when taken from the pump. The taſte is exceeding ſoft, pleaſant and milky, at the ſpring head, and is very agreeable to the ſtomach; but it leaves a ſort of ſtypticity on the palate. It is entirely without ſmell, and is only lukewarm to the touch. It keeps well in bottles that are properly ſtopped, loſing only a part of the elaſtick air, which flies off before the corks can be put in.

With regard to chemical experiments, if a glaſs of water is poured upon a few grains of Sal Ammoniac, it immediately diſſolves it, with a very ſenſible effervеſcence. Oil of Tartar not only produces the ſame effect, but renders the water milky, which after it has ſtood a-while goes off, and lets fall a light earthy precipitate. Diſſolved Soap, dropped into a glaſs of water, immediately curdles, and in a ſhort time the ſurface is covered with a greaſy ſubſtance, and the water below becomes turbid. Twenty drops of the Solution of Silver, mixed with three ounces of the freſh water, in three hours made it appear as if a ſmall quantity of ink had been dropped therein.

Theſe, and other experiments, ſeem to declare there is ſome degree of an acid in the Briſtol water, though not diſcoverable by the taſte; there is alſo a ſmall portion of ſulphur, becauſe when bottles filled with this water happen to be broken, it will ſtink very much. A gallon contains about 34 grains of ſediment, which is of a light grey colour, of a brackiſh taſte, and bitter in the throat. This will ferment with acids, and turn green, after ſome time, with Syrup of Violets. The ſalt is white, but will not ferment with diſtilled vinegar; and in the air it will grow damp.

Briſtol water is generally allowed to be cooling, cleanſing and balſamick, with a conſiderable degree of aſtringency, which renders it excellent in the diabetes: it will alſo open the urinary paſſages, obſtructed by gravel. It is uſeful in many chronic diſeaſes, that will not yield to a common courſe of medicine, and it is ſerviceable in many internal inflammations. It ſtrengthens the ſtomach, promotes an appetite, aſſiſts digeſtion, and will cure the firſt ſtages of a conſumption. It is good in diſorders of

the eyes, and will cure ulcers therein, if taken warm from the pump, and applied with a ſoft rag: it has alſo cured many ſcrophulous ulcers, by waſhing them in this water, others ſay thoſe of the cancerous kind, drinking the water at the ſame time: it has alſo been found ſucceſsful in the bloody-flux, all internal ulcers, preternatural diſcharges, and bleedings of every kind.

The method of drinking the water, when the patient firſt comes down, is to go to the pump-room in the morning, and drink a glaſs or two before breakfaſt, as alſo about five in the afternoon; the next day the patient takes three glaſſes before breakfaſt, and three in the afternoon: and this courſe is continued during his ſtay at the Hot Wells.

Bath water, when viewed by itſelf in a ſmall quantity, appears clear and tranſparent; but when beheld in the Bath, the ſurface is of a ſea-green colour. The ſmell is not very agreeable, eſpecially in the Hot Bath; but when quite freſh it has a ſoft and milky taſte. There are four Baths in this city, which differ from each other, chiefly in their degree of heat: namely, the Croſs-Bath, the Hot-Bath, the King's-Bath, and the Queen's-Bath.

With regard to the experiments made with it, it is obſervable that when carried at a diſtance from Bath, it will precipitate Silver out of Spirit of Nitre into a hardiſh curd; but not ſo much as common ſalt: however, it is concluded from hence by ſome, that ſea-ſalt predominates in Bath water. The King's-Bath, and Hot-Bath, will turn the ſolution of Silver white, with a bluiſh caſt, which becomes gradually more duſk-coloured, and then depoſits a dark grey ſediment. The ſolution of Engliſh Vitriol, mixed with this water, turns to a pearl colour; that is, with the King's-Bath and Hot-Bath, and both will be covered with a thin variegated pellicle. With Oil of Vitriol, and other acids, the Bath waters will excite ſome inteſtine motion, and greatly blunt the acidity. If one part of boiling Milk be mixed with two parts of Bath water, a thin whey and curd will appear, if the water be juſt taken up. A drachm of Syrup of Violets will give a graſs-green colour to an ounce of the King's-Bath water, as well as of the Hot-Bath in 24 hours time.

Some experiments ſhew there is a vitriolic principle in the Bath waters; for if they be taken freſh from the pump, in clear froſty weather, Galls will tinge them of a purple colour; but when cold, they ſcarce make any alteration at all. It is generally thought to be owing to the ferruginous principle of Bath water, that it will make better and blacker ink than common water. Likewiſe the ſand of the Baths, expoſed to the air for ſome time, will become vitriolic, and make ink with infuſion of Galls. That there is an ochre in this water, appears from the yellow colour of the ſtones in the bottom of the Bath, and from the yellow matter like thin cream floating on the ſurface of the water, in the winter time.

From theſe and other experiments it is concluded, that there is a mixture of calcarious ſubſtance with the ochre; and the mud is found to conſiſt of a bluiſh clay, with ſome teſtaceous particles; when it has been uſed as a cataplaſm, it has ſomewhat of the ſmell of ſulphur, and when rubbed on ſilver it changes it black. The ſand, thrown on a red hot iron, emits a blue flame with a ſulphureous ſmell, and being expoſed to the air becomes vitriolic, as before obſerved.

A gallon of the Queen's-Bath water will yield 155 grains of ſediment, the Hot-Bath 139, and the Croſs-Bath 130. The quantity of a calcarious and argillaceous ſubſtance is double to that of the ſaline; the quantity of ſalt in each gallon ſcarce exceeds 43 grains, and the reſt of the matter is a grit, with a blue ſulphureous earth or marl. The groſs remainder emits a ſtrong ſulphureous ſmell, with a blue flame upon calcination, and by this operation a fourth part of the weight is loſt, by burning away. The reſult of all the obſervations of different Phyſicians plainly ſhew, that the minerals in Bath water conſiſt of a calcarious and marly earth and ochre, a marine or ſea-ſalt, a little calcarious nitre, a glaſs of vitriol, a little bitumen, and a very ſmall quantity of ſulphur, which laſt can be made to appear no otherwiſe, than by conſequences.

The Bath Phyſicians are agreed, that the Bath waters are uſeful in all diſeaſes of the head and nerves, ſuch as convulſions, palſies and epilepſies; in all diſeaſes of the ſkin, obſtructions of the bowels; in ſcirrhoſities of the liver, ſpleen and meſentry; in moſt diſeaſes of women, and in the ſcurvy and ſtone. The Bath waters are certainly a moſt powerful deobſtruent, and their energy is ſo great, and their operation ſo ſudden, that a very exact preparation of the body is required, and a ſtricter regimen than in drinking other waters. Likewiſe, a regard muſt be had to the habit of body, the ſeaſon of the year, the ſymptoms of the diſeaſe, the changes of the weather, and the different degrees of heat in the ſeveral Baths. As for inſtance, the heat of the King's-Bath, without due precautions, is apt to inflame the blood, heat the bowels, and ſometimes cauſe a fit of the gout. As to the manner of the operation of Bath waters, whether by bathing or drinking, or both, their effects are thus enumerated. Externally, they will heat, dry, attenuate, reſolve and ſtrengthen, and have a ſingular virtue in diſeaſes from a cold and moiſt cauſe. They eaſe pains, diſperſe cold tumours, dry up moiſt ulcers, and are very advantageous in phlegmatic diſeaſes. It is alſo remarkable, that nothing more effectually prevents too great a corpulency than the frequent uſe of theſe Baths. Bathing cures contractions and relaxations of the limbs, reſtoring loſt ſenſe and motion; but it is not proper in a fit of the gout, except in the decline of that diſtemper. It is alſo highly ſerviceable to thoſe, whoſe ſinews are impaired and crippled by the ſevere fits, and their frequent returns.

The Bath waters taken inwardly, to two or three quarts, commonly give two or three ſtools extraordinary; and it is remarked of the Hot-Bath, that it generally keeps the body open, while the King's-Bath has a contrary effect. When they are uſed as an alterative, they dilute, attenuate, ſweeten, ſtrengthen and heal, correcting the acrimony of the firſt paſſages, and curing the many diſorders of thoſe parts. They ſupply a want of ſpirits, and are good in diſeaſes, where the ſecretions are diminiſhed, as well as in all cachectic and ſcorbutic habits of body. They are very ſucceſsful in hypochondriac diſorders, and melancholy, as well as in diſorders of the urinary paſſages, particularly ſharpneſs of urine, the ſtrangury, gravel, and ulcers of the bladder. The uſual time of bathing and drinking theſe waters is generally five or ſix weeks, and, in obſtinate caſes, they muſt be repeated every year. The common quantity drank is from a pint to a quart and half a pint a day; but ſome have been allowed to drink a gallon every day, and then the patient muſt begin with ſmall doſes.

Alford is a village 24 miles ſouth of Bath, and is remarkable for its mineral water, which has a nauſeous bitter taſte, and will curdle with ſoap, as well as yield a white grumous ſediment with the ſolution of Pot-aſhes. It turns of a dilute green with Syrup of Violets, and Galls will produce a greeniſh cloud on the ſurface, which deſcends deeper in two or three days. A gallon will yield ſix drachms of ſediment, conſiſting of calcarious nitre and ſea-ſalt, with a little lime-ſtone. It is cooling, cleanſing, and penetrating, will attenuate groſs humours, de-

ſtroy acrimony and temperate ebullitions of the blood; hence it is good in the ſcurvy, jaundice, and all ſorts of oſtructions. It cleanſes the urinary paſſages, purges briſkly, and promotes urine and ſweat.

Lincomb Water is ſeated near Bath, and the water is by ſome called Lincomb Spa. When firſt taken up, it has a light, briſk, ſulphureous ſmell, which it loſes in ſix or eight minutes time; but its taſte of iron is more laſting, that is, for the ſpace of eight hours. It is tranſparent at firſt, but becomes bluiſh with ſtanding, and throws up to the ſurface a thin, variegated unctuous ſcum. From various experiments it appears, that this water is impregnated with iron and a little ſulphur, as alſo with bitumen, and a ſmall quantity of alkaline ſalt. It paſſes off quickly by urine, mends the appetite, and raiſes the ſpirits. It is ſerviceable in diſorders of the firſt paſſages, and is good in cachexies, the jaundice, and recent obſtructions of the liver: it alſo deterges and heals ulcers of the kidnies, and removes the ſtrangury. Outwardly, it cleanſes and heals ſcrophulous ulcers, dries up ſharp humours, and cures foulneſſes of the ſkin.

Queen's-camel is a village five miles north of Sherborne, where there is a ſpring that proceeds from a hard rocky bank, and is called the Black-Well. It ſmells like the waſhings of a foul gun, and, from the trials made with it, appears to contain a conſiderable quantity of ſulphur, ſome natron, and a calcarious earth. It cures, by bathing, ſcorbutic, leprous and ſcrophulous diſorders; and it has been obſerved to cure dogs of the mange, by dipping them therein.

STAFFORDSHIRE has only three mineral warers, whoſe virtues are aſcertained, one of which is at Codſall, a village 12 miles ſouth-weſt of Stafford, that is in the wood adjoining thereto, which is a ſulphureous ſpring, and the ſulphur is mixed with ſalt, but not ſufficient to reſtrain the volatility of the ſulphur, ſo that in the winter, before rain, it may be ſmelled twenty yards off. It will lather with Soap, will not curdle Milk, and with Syrup of Violets will turn green; but neither Galls, Oak-leaves, nor a ſolution of Sublimated Tartar, would throw down the ſulphur: however, Spirit of Urine did, and turned it of a faintiſh red. When leproſies were more frequent, this water was famous for curing them; but at preſent it is only uſed in ſcrophulous caſes, and it operates both by ſtool and urine. They brew their beer with this water, and in Dr. Plot's time there was a houſe, called the Brimſtone-Alehouſe, where no one that lived there was troubled with diſeaſes of the ſkin.

St. Eraſmus's-Well is in the grounds belonging to the Lord Chetwynd, near Ingeſtre, two miles from Stafford. The water is clear, and of the colour of Sack, but has no remarkable taſte, nor ſmell. A gallon of this water will yield 300 grains of ſediment, whereof 272 are ſalt, and the reſt moſs. We are not told what diſeaſes it is uſed for, nor indeed that it is uſed at all.

Willoughbridge is ſix miles north-eaſt of Drayton in Shropſhire, and in the park near it there is a well, whoſe water is as clear as cryſtal; but it renders the ſides of the glaſſes, after they have been uſed awhile, a little oily, and of a bright yellow colour. If a few drops of a ſolution of Sublimate be let fall into this water, it preſently becomes of a deep ſack-colour, which ſeems to ſhew it has ſomewhat of a lixivial ſalt. It will lather with Soap, but will not curdle with Milk, nor change colour with Syrup of Violets. Contrary to moſt other waters, it leaves nothing behind it, after the evaporation of ſeveral gallons. Its oil or ſulphur is ſo very volatile, that when diſtilled in a glaſs body and head, the Oil of Sulphur comes over the helm, upon the firſt heat, and is always in the receiver, before the leaſt drop of water appears. There is ſuch plenty of this water, that at leaſt 60 ſprings have been counted, that ſend forth plentiful ſtreams. Dr. Plot informs us, that theſe waters have performed many wonderful cures, which he attributes to its balſamic virtue, and its great ſubtilty and volatility; and he farther adds, if we were to judge of the waters, from the many atteſted cures, it bids as fair for an univerſal medicine, as any thing elſe in the world.

SHROPSHIRE has a mineral water at Moreton, a village two miles weſt of Market Drayton, which will not lather with Soap, but curdles Milk, and yields a white ſediment with Oil of Tartar; it turns green with Syrup of Violets, and ſcarlet with Log-wood. A gallon of this water will yield 277 grains of ſediment, whereof 76 are earth, and the reſt a calcarious nitre. It is an excellent cooling diuretic and cathartic, and purges very briſkly. It bears a great reſemblance to Holt water, only the taſte is more pungent, and conſequently it is very likely to have the ſame virtues.

Pitchford is a village ſix miles ſouth by eaſt of Shrewſbury, which takes its name from the pitchy ſpring that is found there, on the top of which there floats a liquid bitumen, though it is ſcummed off every day. It is found to be excellent for wounds, and will cure inveterate ſcrophulous ulcers.

Broſeley is a village four miles north-eaſt of Wenlock, and has a burning Well, which was diſcovered about the year 1711. A candle being put down into the well, it will take fire at the diſtance of a quarter of a yard, darting and flaſhing in a violent manner, to the height of 1820 inches. It is hotter than common fire, and boils any thing much ſooner. It appears to be impregnated with a ſort of liquid bitumen.

In SURRY there are ſeveral mineral waters, the moſt famous of which is at Epſom, a town about 15 miles ſouth-weſt of London. The water is pretty clear and without ſmell; but if it be kept in covered veſſels for ſome weeks in ſummer, it will ſtink, and acquire a nauſeous bitter taſte, with ſomewhat of a maukiſh ſaltneſs. It will curdle with Soap and Salt of Tartar, and with Spirit of Sal Ammoniac it will let fall a grumous ſediment; but if mixed with lime-water, it will continue clear. A gallon will yield an ounce, ſometimes an ounce and a half, of a ſort of cream and ſediment, which is of a greyiſh colour, almoſt impalpable, of a brackiſh, nauſeouſly bitter taſte, and an odd ſtrong flavour. There are about eight parts of ſalt to one of earth, the former of which is of a whitiſh yellow colour, and of a ſingular ſtrong ſmell, with a nauſeous bitter taſte. All authors agree, that the cryſtals of this ſalt will require but a ſmall proportion of water to diſſolve them, for an equal weight has been found ſufficient. The ſalt has a purging quality, for half an ounce, diſſolved in ſpring water, will work like other phyſic. The water itſelf is a diluent, and a mild abſorbent: it is alſo diuretic and cathartic. Poor people formerly uſed to waſh old ſores with the water, with a good effect. A doſe of the water, in ſummer, is two thirds of a pint, and in the winter, half a pint.

Stoke is a village two miles ſouth of Cobham, where there is a ſpring commonly called Jeſſop's-Well. This water is thought to contain more ſalt than any purging water in England, and it has a taſte much like that of Epſom-Wells. A gallon of this water yields an ounce and a half, with 22 grains of ſediment, that is, 742 grains in all. It is very white, and has ſomewhat of a brackiſh taſte, with a nauſeous bitterneſs. The earthy matter bears but a ſmall proportion to the ſalt, which, as Dr. Hales informs us, will ſhoot into very bitter, irregular oblong cryſtals, ſome of which have retained

tained their former firmneſs, for five years at leaſt. Half an ounce of diſtilled water will diſſolve only 10 grains of ſalt, though ſtanding by the fire-ſide, in which it greatly differs from that at Epſom. From the experiments made with it, it appears, that this water contains a large proportion of calcarious nitre, a little ſalt and calcarious earth, and very probably a little natron. A leſs quantity will ſuffice for a doſe than of any other; for which reaſon it ſits better on the ſtomach, and enlivens the ſpirits of thoſe that drink it. It has been long noted as a good purging water; for a ſingle quart will purge pretty briſkly, and promote plenty of urine without gripes. It cures obſtinate ſcorbutic caſes; and, as ſome think, there is a fine volatile ſpirit in the water; it may be drank for a conſiderable time, as an alterative, with happy conſequences.

Stretham is a village ſix miles ſouth of London, that has been long remarkable for its medicinal ſpring. The water has ſomewhat of a yellowiſh tinge, and throws up a ſcum variegated with copper, blue and green colours. At the ſpring head it has a ſaline nauſeous taſte, and a gallon will yield 200 grains of ſediment, the ſalt of which has a penetrating, brackiſh taſte, with a ſtrong flavour, and in the air it will almoſt melt. This is partly marine, and partly nitre, enveloped with a little ſulphur, and a greater proportion of abſorbent earth. When it was moſt in vogue, three pints boiled to a pint and a half were given as a purge; for it operates both by ſtool and urine, and it has been found good in diſorders of the eyes.

The Dog-and-Duck is a noted public houſe in St. George's-Fields, in the pariſh of Lambeth near London. The water is clear, and has very little taſte; but a gallon will yield 200 grains of ſediment, of a dirty colour, and a pungent, brackiſh taſte. The earthy matter is as one to twelve, in proportion to the ſalt, and it will ferment ſtrongly with Spirit of Salt and Spirit of Vitriol; but will not turn to perfect lime by calcination. This water has been noted for curing leprous diſorders; and ſome have affirmed, that it cured an ulcerated cancer in the breaſt by drinking the water, and keeping a cloth, wet therein, always over it. Being drank from one pint to three, it generally purges eaſily and briſkly, without affecting the ſtrength, unleſs in very tender conſtitutions. It may be taken as an alterative, inſtead of common drink, for the cure of ſcorbutic pimples, tetters, the leproſy, and the king's evil. It is alſo a palliative cure in cancerous diſorders, and has been the means of prolonging the lives of ſeveral. The only fault of this water is, its being too cooling, for which reaſon it is prejudicial to perſons of phlegmatic conſtitutions, and of weak habits of body.

Cobham is a town ſeated in the road between London and Guildford, and is ſeven miles ſouth-weſt of Kingſton. The water has a ſenſible taſte of iron; and a gallon will yield ſeven grains of a ſubſtance like ochre, which a loadſtone will attract, without calcination. It is a ſtrong chalybeate, and deſerves to be more known.

WARWICKSHIRE has two mineral ſprings, one of which is at Lemington, three miles ſouth-weſt of Dunchurch, and is of a ſaline nature. A gallon yields 960 grains of ſediment, 30 whereof are calcarious nitre, and the reſt ſea-ſalt. It is a ſtrong purge and vomit, and is drank by labouring people from two quarts to three. It is noted for curing ſore legs, and diſeaſes of the ſkin.

Ilmington is a village ſeven miles ſouth of Stratford upon Avon, and the water found here, though it has a brackiſh taſte, is one of the ſtrongeſt chalybeates in England. It ſparkles at the ſpring head like bottled cyder; but it will not curdle with Milk, and yet Oil of Tartar will procure a ſmall coagulum. It will turn purple or black with Galls, according to the quantity; but with Syrup of Violets it changes to a green. A quart of water will yield near a ſpoonful of a reddiſh white powder, that will ferment and fume with acids. Thoſe that drink this water have their ſtools tinged blackiſh, and though it generally operates by urine, it will ſometimes purge. Internally, it is good in the ſcurvy, obſtructions of the bowels, the jaundice, and beginning of the dropſy; it is alſo good in the ſtrangury, and difficulty of making water.

WESTMORELAND has a mineral water at Kirkby-Thower, a village eight miles eaſt of Penrith, which is a weak purging chalybeate. It is exceeding clear, ſweetiſh, and has a little taſte of tea. It grows whitiſh with alkalies, and turns to a clear purple with the Solution of Silver; but it becomes of a pink purple with Galls, a red purple with Logwood, and a deep green with Syrup of Violets. A gallon contains 190 grains of ſediment, of which 140 are lime-ſtone, and 50 a calcarious nitre. The ſalt will not diſſolve entirely in 48 times its own weight of diſtilled water; but it will turn of a pale green with Syrup of Violets. This water is a more powerful abſorbent than any other of this kind, and it will purge well, if drank to the quantity of three or four quarts.

Shapmore is a marſhy heath, lying between the mountains to the north of Shap. The water here ſeems to be of a ſulphureous nature, for it has a ſtrong fœtid ſmell, and a ſenſible bitterneſs; but this ſoon goes off when it evaporates over the fire. It will curdle with Soap, and let fall a large white ſediment, with the Solution of Pot-aſhes. A gallon will yield 376 grains of a ſaline ſediment, with a ſmall proportion of very white earth. It is very white, and has a ſalt, pungent, bitter taſte, growing moiſt when expoſed to the air. This water has been caſually found to work by ſtool and urine, and three pints have proved a very ſtrong purge. It will cure inveterate piles, and is uſed by the common people to cure rheumatic pains in the joints, by rubbing it warm on the parts affected.

Wiſherlake is a village ſeven miles ſouth-weſt of Kendal, where the mineral ſpring has a ſaltiſh taſte, and in ſummer ſmells a little like ſulphur, throwing up a whitiſh ſcum. With Oil of Tartar it lets fall a pearl-coloured ſediment, and with Galls it precipitates one that is purple. A gallon yields 547 grains of ſediment, conſiſting chiefly of ſea-ſalt and a calcarious earth, with a little mixture of a bitter, purging ſalt. From experiments made with it, it appears that it is chiefly impregnated with ſea-ſalt, combined with a kind of calcarious nitre, a little iron, and a ſmall quantity of ſulphur. It has been found of great uſe in the ſtone, gravel, worms, want of appetite, the cachexy, jaundice and dropſy.

WILTSHIRE has a mineral ſpring at Chippenham, lately taken notice of, and was found in a garden near the river. At the ſpring head it has a briſk ferruginous taſte, and turns of a claret colour with Galls. A gallon will yield 39 grains of a ſediment of the colour of ochre, which has a very brackiſh taſte. It contains a ſtrong ſea-ſalt, and a natron combined with iron. It has cured ſcorbutic diſorders, beſides others that are not particularly taken notice of.

Weſt Aſhton is a hamlet in the pariſh of Steeple-Aſhton, four miles eaſt of Trowbridge, which has a ſpring that yields plenty of water all the year round. It is clear, and will depoſit a ſmall quantity of ſediment, after it has been kept ſeveral months in bottles. It will curdle with Soap, and lets fall a white grumous ſediment with the Solution of Pot-aſhes. A gallon will yield two drachms and two ſcruples of a whitiſh ſediment, with a ſaline bitter

taſte

taſte and warmneſs on the tongue. It is chiefly impregnated with ſea-ſalt, nitre, and a little iron, with a ſmall matter of ſulphur. The water is beſt drank at the fountain head, and three pints is purging and diuretic.

Road is a village eight miles north of Bath, where there is a mineral Spring, whoſe water has a chalybeate and ſulphureous taſte and ſmell. A gallon will yield near a drachm of a yellow coloured ſediment, that has a ſalt and pungent taſte. The water appears to be impregnated with iron, ſulphur, and a ſtrong, native alkali or natron. It is a very gentle purge, and is good in ſcrophulous caſes and diſeaſes of the ſkin; it will alſo cure ſcorbutic ulcers.

Holt is ſix miles eaſt of Bath, and is of note for its medicinal ſpring, firſt taken notice of in the year 1713. It will let fall a groſs, grumous ſediment with Oil of Tartar, and when mixed with Spirit of Sal Ammoniac, a white cruſty ſubſtance adheres to the ſides of the glaſs. It will not lather with Soap, but will ferment with Oil of Vitriol. With Syrup of Violets it will become greeniſh, and with Galls change to a green. Logwood turns it to a deep red, Brazil Wood to a ſcarlet, and Rhubarb to a pale amber colour. A gallon will yield 176 grains of very white ſediment, which has a ſaltiſh, bitter taſte, and will grow moiſt in a damp air; but the earthy part is nearly equal to the ſalt. This water principally contains a calcarious nitre, and the operation is more mild than other ſprings of this kind, on account of a large quantity of earthy matter contained therein. In ſmall doſes it is an alterative and diuretic; but two quarts will purge pretty briſkly. It will dilute, cool, abſorb and ſtrengthen, and is uſed both externally and internally. Rags, or a ſponge, dipped therein, will cure ſcrophulous ulcers, attended with carious bones; but then it muſt be taken inwardly at the ſame time. It will alſo cure inveterate running ulcers of the legs and other parts, and diſeaſes of the ſkin, attended with great heat and corroſive humours. It is good for ſore eyes, the piles, and ulcers of a cancerous nature, uſed outwardly and drank inwardly. It never fails of procuring an appetite, and will ſtrengthen the relaxation of any part.

YORKSHIRE has ſeveral mineral Springs, of which the principal one is at Malton, otherwiſe called New Malton, that lies in the road from York to Scarborough. The ſpring lies at the weſt end of the town, and is ſo ſtrongly impregnated with iron, that it is called the Malton Spa. Seven pints contain three drachms and a half of a reddiſh brown ſediment, which has an auſtere bitteriſh taſte, and a ſalt of a calcarious nitre, though different in ſome ſenſe from others; for it will not ferment with Oil of Vitriol, nor Spirit of Salt; but it will turn greeniſh with Syrup of Violets. The mud and ſcum of this water will dry up and heal old ulcers, ſcabs and tetters to a wonder. Internally, the water works agreeably by ſtool and urine, unleſs the ſtomach be foul, and then it will vomit the firſt day or two. The common doſe is from three pints to ſix; but ſome think ſmaller doſes would be more proper. It is good in the hypochondriac melancholy, in an aſthma with ſpitting of blood, and in internal ulcers and bleedings. It is alſo recommended in obſtructions of the bowels, and in a relaxation, weakneſs, and languidneſs of the body, it being a ſtrengthener and a deobſtruent as well as a purge.

Croft is a village in the North-Riding of Yorkſhire, on the confines of the biſhoprick of Durham, where there is a ſpring of fine, clear, ſparkling water, with a ſtrong ſmell of ſulphur. A gallon yields 177 grains of a very white ſediment, which has a ſtrong ſmell like that of hawthorn flowers. It conſiſts of lime-ſtone, nitre, and ſea-ſalt; but the nitre is double or treble to the latter. It is a purging water, if drank from four pints to nine, and is ſaid to have performed many eminent cures, both by drinking and bathing.

Harrowgate is two miles north-weſt of Knareſborough, in the Weſt-Riding; it is ſuppoſed to be the ſtrongeſt ſulphureous water in Great Britain. A gallon of that commonly drank, for there are three wells, contains two ounces of pure ſea-ſalt, and near two ſcruples of earth; therefore the predominating ſalt muſt needs be marine. A warm bath made with this water cures achs, bruiſes, ſtrains, lameneſs, weakneſs of the back, beginning of the dropſy, and paralytic pains and weakneſſes. It alſo diſſolves hard ſwellings, cures old ulcers, and all diſeaſes of the ſkin; it has alſo great power in eaſing the gout and ſciatica. Internally, drank from three to four pints, it purges briſkly, and raiſes the ſpirits. It powerfully cleanſes the ſtomach and inteſtines, killing all ſorts of worms; beſides which it will cure the cold ſcurvy, and help the jaundice of many years ſtanding. It alſo cures diſorders of the ſpleen, the green ſickneſs, cramp, the head-ach, and the king's evil.

Broughton water proceeds from a ſpring, in the road from Skipton in Yorkſhire, to Coln in Lancaſhire, the village being in the mid-way between thoſe two places. It is of a whitiſh colour, and colder than common water, as is obſervable in others of the ſulphureous kind. A gallon contains four drachms of ſediment, the fourth part of which is earth, and the reſt ſea-ſalt and nitre. The virtues are much the ſame as thoſe of Harrowgate water, but weaker.

Wiggleſworth is a village in the Weſt-Riding, four miles ſouth of Settle, where there is a ſpring remarkable for yielding an alkaline nitrous ſalt. It is very black, and has a ſtrong ſmell of ſulphur, with a ſaltiſh taſte, and lathers with Soap; but will not curdle Milk. Three gallons yield ſeven drachms of ſediment, of which ſix ſcruples and a half are black earth, and the reſt ſalt. The country people drink four or five pints of this water as a vomit, and ſix or ſeven as a purge; but it ſeems ſtrange that more ſhould be required for the latter than the former.

Newton-dale is in the North-Riding, 12 miles weſt by north of Whitby. The water here is cold and very aſtringent; and it petrifies every thing in its courſe, producing various and beautiful incruſtations and figures. It effectually cures looſeneſſes and bleedings of every kind, both in men and beaſt; and it quickly and wonderfully reſtores weakened joints, that are even beginning to be diſtorted, by bathing therein.

Knareſborough is noted for a dropping Well, ſo called, and is a market-town in the Weſt-Riding. The water is very cold, extremely limpid and ſweet, and it will let fall a white ſediment with Oil of Tartar. It has a petrifying quality, and its particles conſiſt chiefly of ſpar and ſome ſulphur. A gallon of the water, that fell from the petrifying rock, yielded 185 grains of ſediment, of which ſeven ſcruples and four grains left five ſcruples and four grains of earth, which would ferment with acids; and there were two ſcruples of ſalt, which ſhot into nitrous cryſtals. It cures inveterate fluxes of the belly, bloody fluxes, and the diabetes, as well as all preternatural diſcharges of blood; alſo colliquative ſweats, as well as ulcers of the bowels, and hectic fevers. Three half pints are a doſe.

Scarborough Water is the moſt noted in all Yorkſhire, and was diſcovered about 160 years ago. It has been much uſed of late years, not only at the fountain head, but at diſtant places. The taſte is bitteriſh and ferruginous; it curdles with Soap, and yields a large white grumous ſediment with Oil of Tartar. A gallon yields about 284 grains of a reddiſh

diſh white colour, with a bitter, ſaltiſh and roughiſh taſte. It deſtroys the ſourneſs of acids, ferments ſtrongly therewith, and turns of a light green with Syrup of Violets. The proportion of earth to the ſaline parts is as 66 to 150. The water has been found good in hectic fevers, the rheumatiſm, ſcurvy, preternatural thirſt, recent and partial inflammations, and diſeaſes of the ſkin. It is alſo good in diſorders of the ſtomach from intemperance, as well as in hypochondriac and hyſteric diſorders; in aſthmas, in habitual coſtiveneſs, the heart-burn, and in all caſes where purging is indicated.

CHAP. III.

Of EARTHS and CLAYS.

THAT ſort of Earth, which we call SOIL, proceeds from the putrefaction of animal and vegetable ſubſtances, and will burn in the fire and ſwim in the water. Linnæus has nine ſorts of theſe, whereof one does not properly belong to this claſs: the others are, the Marſhy Soil interwoven with roots, and this is the ſame that we call Turf, which in many parts of England is uſed for ſuch. The Vegetable Watery Soil is nothing elſe but Mud, and is to be met with every where in and about ſtanding waters. The Spungy Soil of heaths will ferment with ſome ſort of fluids, particularly acids. The Vegetable Soil of the Alps is to be met with every where among thoſe mountains, and is a little reddiſh, or rather of a blackiſh brown. The Vegetable Common Black Soil is met with in various places, particularly in meadows, fields, and paſtures. The Vegetable reddiſh Soil, partaking of Ochre, is particularly found in Weſt Gothland. The Animal Soil of brute beaſts may be met with in places where ſeveral of thoſe animals have been laid in heaps, and have putrified and turned to Duſt; that of human bodies may be ſeen in every churchyard.

A CLAY is a heavy, thick, fat, tenacious, ſmooth Earth, which when held in the mouth becomes like ſoap or ſuet; it is either ſoft or hard, in proportion to the quantity of Water that is mixed with it, for it readily diſſolves in that fluid. When it is ſoft, it may eaſily be ſhaped into any form; but, when it is baked in the fire, it turns into a ſtony ſubſtance. There are a prodigious number of different ſorts of Clay, and of different colours.

The Clay that is perfectly pure and white is of a very fine texture, and when cut, leaves a poliſhed ſhining ſubſtance; when examined by a microſcope, it appears to be of a cloſe, even, regular texture, unleſs mixed with particles of a different kind. It will ferment pretty briſkly with Aqua Fortis, as will moſt other kinds; for Linnæus makes it a characteriſtic of Clay. Whether we have here any of this ſort is uncertain.

The CIMOLIAN EARTH of the ſhops is a ſort of Fullers-earth, and is of a dull white colour, though the ſurface is tolerably ſmooth. When burnt in the fire, it becomes very white and hard, and in a violent fire will turn to a dirty ſort of Glaſs. It is to be met with in ſeveral parts of England, particularly at Wedenſbury in Staffordſhire, where they uſe it for making tobacco-pipes, as they do another ſort, which is hard, heavy, and of a greyiſh white, which is ſaid to be the beſt of all Tobacco-pipe Clays. Beſides theſe, there are the White Tough Clay, the Smooth Greyiſh White Clay, the Heavy Grey Clay, the Soft Grey Alkaline Clay, a Hard Grey Alkaline Clay, a Soft Aſh-coloured Heavy Clay, and ſeveral other kinds, whoſe differences are not ſo conſiderable as to be particularly inſiſted upon. They are uſed for making tobacco-pipes, Dutch tiles, and ſeveral ſorts of earthen ware.

The EARTH of MALTA, ſo called from the Iſland from whence it is brought, is a ſort of Clay of a whitiſh aſh colour, and is imported in ſmall cakes, marked with various characters.

There are four ſorts of YELLOW CLAY, all which will ferment with Aqua Fortis; one of theſe is entirely yellow, another yellow with blue ſpots, the third is a ſandy Clay, and conſequently brittle, as well as the fourth, which is of a browniſh yellow. They are all of uſe for making ſome ſorts of earthen ware.

The Hard Brown Spotted CLAY is in ſome degree tranſparent, and is of a fine ſhining pale brown, variegated and ſpotted with deep black. It does not ſtain the hands when touched, and yet it adheres firmly to the tongue, having a ſort of an aſtringent taſte, but without grittineſs. This is what is uſually called Lemnian Earth, or The True Sealed Earth, and is brought over in ſmall cakes, weighing above four drachms each, and marked with ſeveral characters. The iſland on which it is dug was formerly called Lemnos, but now Stalimene. The virtues of this Earth, or Clay, were formerly much celebrated, and it was given as an antidote againſt poiſons. It was ſuppoſed to be of an alkaline ſubſtance, but this is found to be a miſtake; for it will not ferment or effervеſce with Aqua Fortis, nor indeed ſeveral others, notwithſtanding what Linnæus has ſaid to the contrary. When analyſed, it is found to contain a ſmall quantity of an urinous volatile Salt, a ſmall matter of bituminous oil, and a little Salt like common Salt. It may be eaſily diſſolved in Water, and has been given in ſome diſorders; but it is now not uſed with us.

There are three ENGLISH CLAYS of the brown ſort, as the Brown Heavy Tough Clay, with which they floor barns in ſome places, and in others make earthen veſſels. The Duſky Bluiſh Brown Tough Clay, which when burnt in the fire turns to a red colour, and in a violent fire to a deep graſs green; however, it is moſt uſeful for making of tiles. The Hard Pale Brown Clay is generally full of ſhining particles, and is of a rough kind; but being mixed with tougher Clay in Staffordſhire, it ſerves to make ſtrong veſſels of ſeveral kinds.

The Bluiſh Brittle Soft CLAY has ſomewhat of the nature of Marl, and when dry it appears to be full of ſhining particles. It burns to a darker colour, and is uſed in ſeveral parts of England for making a very ſtrong ſort of earthen ware. The Tough Bluiſh Clay has an even ſmooth ſhining ſurface, and when burnt in the fire becomes as hard as ſtone, and of a fine red colour. It is to be met with in Northamptonſhire, but at preſent is made no uſe of. The Hard Tough Pale Blue Clay is extremely heavy, and of a cloſe, even texture; being burnt it turns to a pale yellow, but it will not well endure the fire. It is uſed to make gally-pots, and the like. The Light Soft Blue Clay is of a looſe texture, and burns to a pale reddiſh brown; there are but ſmall quantities found of it at a time, and therefore it cannot be ſuppoſed to be much in uſe in making any ſort of veſſels. The Hard Tough Whitiſh Blue Clay is ſuppoſed to be that with which they make China ware here in England when mixed with other things; however, this is not certain.

The Green Heavy Turf CLAY is a fine ſmooth compact Earth of a dull duſky green, and very heavy. It has hitherto been put to no uſe. The Pale Smooth Green Hard Clay is of a ſmooth, even, regular texture, very heavy, of a ſhining ſurface, and almoſt as hard as Stone. When a thin piece of it is held up to the light it is almoſt tranſparent; but in the fire it loſes its green colour, and turns to a pale grey. It has been brought from Saxony in Germany.

VERDITER is a ſort of bluiſh green hard Clay, and is uſually dug out of the Earth in lumps of different

ferent ſizes, that is, from half a pound to ſix pounds and upwards. It is a fine even gloſſy ſurface, and very ſmooth to the touch: it does not colour the hand: but when it is drawn along a rough ſurface it leaves a duſky green line. When burnt it is of a duſky brown colour, being entirely diveſted of its green or blue. It has been brought from ſeveral parts; but that from Italy is the beſt, and is much uſed by painters.

The ENGLISH VERDITER is got out of Mendip Hills in Somerſetſhire, and is a hard, heavy, firm earth, of a deep duſky green colour; when burnt it becomes as hard as ſtone, and of a very pale whitiſh brown colour. There is another Greyiſh Green Brittle Clay, that is met with in Mendip Hills, which burſts and crackles in the fire, though the change of the colour is very ſmall; but it acquires a conſiderable hardneſs.

The Soft Pale Red CLAY is very clammy while ſoft, but when dry it is compact and hard, and of a very beautiful pale red, variegated with grey, at leaſt ſometimes. In the fire it grows as hard as ſtone, but the colour is much the ſame. It is brought to London from the Iſle of Wight, and is ſaid to be of ſome uſe to the workers in mahogany wood. The Pale Browniſh Red Smooth Clay has ſomewhat of a Browniſh caſt, and is commonly veined with Pale Bluiſh Grey Clay; it is conſiderably heavy, and of a very cloſe even texture. It crackles at firſt in the fire, but becomes pretty hard. In Staffordſhire it is part of the compoſition of their fineſt earthen ware. The Duſky Brown Reddiſh Blue Clay is found in ſeveral parts of England, particularly in Staffordſhire, where it is a principal ingredient in their fine earthen ware.

The Light Brittle Black CLAY is more dry than the generality of this ſort, and not quite ſo tough; but it is ſeldom met with except in ſmall quantities at a time. In the fire it emits a pale blue flame, with a ſulphureous ſmell, and burns to a very deep red. It is common in many parts of England. The Tough Heavy Black Clay, while in the bed, is of a ſhining jet black, extremely heavy, and pretty moiſt, with a fine gloſſy ſmooth ſurface when cut with a ſpade; when dry, it becomes extremely heavy and compact, and will not diſſolve eaſily in water. In the fire it becomes as hard as ſtone, and of a pale red colour; it was formerly unknown in England, but has been lately met with in Staffordſhire and elſewhere. The Heavy Brittle Black Clay is very fine, heavy, and of a ſmooth compact texture. When burnt, it becomes perfectly white, for which reaſon in Northamptonſhire it is uſed for making tobacco-pipes.

There are ſealed EARTHS in Germany, ſo called, becauſe they are marked with particular ſeals; the principal of which are at Gran in Hungary, and Goldberg in Sileſia. That of Gran is called the Marrow of Gold; it is of a yellow colour and fat, ſeeming to be of a ſoapy ſubſtance, and melting in the mouth. It is got out of the gold mines near Gran, and is under the care of the magiſtrates, who have it made into round balls, and marked with the city ſeal. They ſuppoſe it to be impregnated with a golden Sulphur. The Goldberg Sealed Earth has the name of the Marrow of Silver, and is of a whitiſh grey colour. It is ſuppoſed to be derived from ſilver, from whence it has its name. It is not brought into medicinal practice.

CHAP. IV.

Of MARLS.

MARL is an earthy, brittle, light ſubſtance, between Clay and Chalk; for it is not ſo ſoft and fat as Clay, nor ſo hard as Chalk, nor will it very eaſily diſſolve in water.

CIMOLIAN EARTH is heavy, but looſe and apt to crumble, for which reaſon, being thrown on the ſurface of the earth, it ſoon moulders away. It has not the leaſt effervеſcence when put in water; for it only melts away, and turns to a ſort of ſizy liquor of a greyiſh colour. It is not at all affected with the oil of tartar, but ſpirit of ſalt poured on it cauſes it to ferment. It is pretty fat and ſoapy.

SAMIAN EARTH is very fine, pure, of a cloſe equal texture, and yet remarkably light; when dry, it is of a fine bright white, with a ſmooth poliſhed ſurface; it is very ſoft to the touch, and adheres firmly to the tongue; when burnt in the fire it becomes of a ſnowy white, and is found in the Iſle of Samos; but this, as well as the former, is not at preſent uſed in medicine.

The SAMIAN ASTER is by ſome called Samian Earth, but it differs greatly from the former, it being of a looſe texture, and will not cut into regular pieces. It is of a pale browniſh white, and ſeems rough, dry, and duſty to the touch, but adheres firmly to the tongue. It turns to a pale aſh colour in the fire, and is found between cleſts of ſtone in the Iſland of Samos.

CHIAN EARTH is a denſe compact ſubſtance, but of a ſoft texture, and eaſily broken in pieces. When dry it has an irregular ſurface of a pale greyiſh white, and ſeems to conſiſt of numerous flakes. It is very fine and ſoft to the touch, adheres firmly to the tongue, and melts freely in the mouth. Thrown into the water, it cauſes it to bubble with a hiſſing noiſe, and melts into a ſubſtance like cream; in the fire it becomes perfectly white, and is found in the iſland of Chio; but it is of no uſe in medicine.

CELENEUSIAN EARTH, by ſome called Mineral Agarick, is found in the perpendicular cleſts of the ſtrata of ſtone, in irregular maſſes of a fine pure white colour. It is ſpungy, brittle, whites the fingers, and adheres firmly to the tongue. When thrown into water, it ſends up a great number of bubbles with a hiſſing noiſe, and turns it white. It comes to a ſnowy whiteneſs in the fire, and is found in ſtone quarries almoſt all the world over.

The White Spungy Denſe MARL is not ſo white as the former, but is of a more denſe texture. It is frequently found in the cavities of ſtones, and, if alone, generally near the ſurface of the earth. When it is dry, it becomes of an uneven compact texture, moderately heavy, and of a dull dead white. It bubbles in the water like the former, with a hiſſing noiſe, and is found in many parts of England.

Hard Spungy Alkaline White MARL, called by ſome Native Lime, is a hard, dry, coarſeiſh earth found in the clefts of ſtone, and ſometimes lying looſe upon, or immediately under them. It is of a dull whitiſh colour, with a ſmall mixture of greyiſh brown, and is of a more firm texture than the former earths. It bubbles and hiſſes like the former, and will cement like Lime. It is found in ſome parts of England.

MELIAN EARTH, found in the iſland formerly called Melos now Milo in the Archipelago, is not unlike the Cimolian, and is made uſe of there for waſhing of linen.

CRETAN EARTH, or CHALK, was ſo called by the antients, becauſe it was found in the iſland of Crete, now Candia; but it is now to be met with in moſt parts of the world, and particularly in England, in very great plenty, where there are many large hills of it conſiſting of nothing elſe. It is an Alkali, and therefore is given in acidities of the ſtomach, and the heartburn, when properly prepared; though ſome take it as it is for that purpoſe without any preparation. It is likewiſe good in coughs that proceed from an acrid phlegm. It is commonly given from

from ten grains to a drachm, but there is no danger in taking larger doſes.

Bluiſh Chalk MARL when dry, after it is taken out of the earth, is of a hard texture, of a bluiſh colour, generally veined or ſpotted with red. It is very ſoft and ſmooth to the touch, and will not adhere to the tongue, at leaſt very little. Burnt in the fire, it turns to a paliſh brown, ſtreaked with dark red. It is found in ſome parts of England, and in ſome places ſerves to manure land.

Bluiſh Brown Brittle MARL is of a looſe texture, and very light. It is ſoft to the touch, and adheres a little to the tongue, melting freely in the mouth, it being a pure fine earth. It is ſomewhat alkalious, and when burnt turns to a dirty reddiſh brown colour. It has ſometimes a great many ſea ſhells found in it, and is a good manure for land.

Stony Bluiſh MARL is the hardeſt of this claſs, and is of a rough compact texture, with an unequal ſurface. It bubbles in water, but will not ferment with aqua fortis, and in the fire turns to a dull duſky red. This and the former are found in ſeveral parts of England.

Yellow Brittle Sandy MARL breaks into ſmall pieces, when dug out of the earth, and when dry is of a brighter yellow than before it was dug up, which is the property of all colours; for a little water will turn them darker. It is ſpangled all over with ſmall, flat, glittering particles, and is rough and duſty to the touch. When burnt in the fire, it turns to a fine deep red, and is a good manure for heavy ſtiff Clay lands.

Pale Red Brittle MARL is always found in the cavities of Stone, or in perpendicular cleſts of the Earth, and has a fine, compact, cloſe texture, with an even, ſmooth, ſoft ſurface. It is common in Germany, Italy, and France.

Red Brittle Heavy MARL is very common in England, and is a good manure for poor hungry land. It is of a crumbly texture, and commonly very dry; it becomes of a deeper red in the fire, and much harder.

Deep Duſky Red Sandy MARL is frequently found variegated with whitiſh, greyiſh, or bluiſh Earths, and is of a looſe crumbly texture. It melts very readily in the mouth, but leaves a great deal of harſh, ſandy matter between the teeth; when burnt it becomes of a deeper red, but not much more hard, and is found in our North American Plantations.

Stony Red MARL is greatly valued by the farmers for making a good manure: for, though it is almoſt as hard as a ſtone when laid upon the ſurface of the earth, it will crumble to bits, which perhaps is owing to the rain, as it will break to pieces in about ten hours time in water. Fire makes little alteration in it, and it is found in ſeveral parts of England.

RUDDLE, by ſome called Red Ochre, and by others Marking Stone, is a ſort of Marl of a thin texture, and very brittle. It is of a red colour, and has a ſmooth ſoft ſurface. When burnt it becomes pretty hard, but does not change the colour. It is uſed in the country for marking of ſheep, and by the painters for colouring of pales, window ſhutters, and the like. The beſt is ſaid to be brought from Derbyſhire.

Red Heavy Hard MARL is firmer and drier than the former, it being of a regular cloſe texture, and compoſed of ſeveral thin plates lying cloſe upon each other. In the fire it burns to a darker red, and grows much harder. It is uſed by the furriers to mark with.

Brown Brittle MARL is of a looſe texture, and eaſily crumbles, but makes a very good manure. It is ſometimes variegated with grey, and ſometimes with black, and is a little dry and duſty to the touch. When burnt it becomes of a pale red, and ſomewhat more hard. It is uſed to manure graſs land in Suſſex.

Fullers EARTH is well known almoſt to every one, being commonly uſed for getting greaſy ſpots out of cloaths. It is ſoft, and of a greyiſh colour; but ſometimes paler, and ſometimes of ſo deep a colour as to be almoſt black; though it has always a greeniſh caſt. It melts freely in the mouth, and for its ſoftneſs and ſmoothneſs is ſometimes called Soapy Earth.

Green Fullers EARTH is the moſt denſe and compact of all kinds of Marl, and is of an even ſmooth texture, being extremely ſoft and oily to the touch. It melts freely in the mouth, and in the fire turns to a very pale brown. It is found in Germany, where it is uſed as common Fullers Earth.

Green Sandy Brittle MARL, though very heavy, is of a looſe texture, and eaſily crumbles in pieces. It is found in many parts of England, and is uſed in Suſſex to manure clay lands.

Black Brittle MARL is of a looſe texture, eaſily crumbles, and is very heavy; though it is of a browniſh black, it does not ſtain the hands. It is found in Mendip Hills in Somerſetſhire, above twenty feet deep in the earth.

CHAP. V.

Of LOAMS or EARTHS found in Strata or Beds.

THE WHITISH LOAM is coarſe, looſe, ſoft, and moiſt, while in the ſtratum; and though it is eaſily cut with a ſpade, it will not ſtick thereto. When dry it is of a looſe crumbly texture, conſiderably heavy, hard, harſh, and gritty to the touch. It does not at all ſtick to the hand, but will melt freely in the mouth, and makes a ſlight hiſſing noiſe when thrown into the water, where it almoſt immediately falls into a looſe powder. It is compoſed of a large coarſe white ſand, united to a greyiſh marly clay, and will burn to a pale browniſh red. It is ſometimes mixed with ſtiff clays in making of bricks.

The Browniſh White LOAM is of a fine even texture, and conſiſts of very fine white ſand joined to a pale brown clay. When it is cut with a ſpade it leaves an even ſurface, and when dry it is of a whitiſh brown colour, but very pale. It does not break very eaſily between the fingers, nor does it ſtick to the hands; but it will melt in the mouth, though ſlowly, and makes a violent effervеſcence with aqua fortis. It is uſed for making bricks mixed with clay, and then turns to a pale red colour.

The Pale Yellow LOAM is of a ſpungy texture, and conſiſts of white ſand united to a yellow clay. When it is cut with a ſpade, it leaves irregular maſſes, with a rough uneven ſurface behind it, and when dry it is looſe and ſpungy, and ſeems mixed with a great number of ſhining particles. It is harſh and dry to the touch, and crumbles readily between the fingers, but does not ſtick to the hand. It makes an effervеſcence with aqua fortis, and turns red in the fire; but it is never uſed alone for bricks.

The Rough Yellow LOAM conſiſts of a coarſe yellowiſh ſand, joined to a pale yellow clay, which in a few places is white. It is ſmooth when cut with a ſpade, and when dry is extremely hard. It makes no effervеſcence with aqua fortis; but when thrown into the water it makes a little hiſſing noiſe, and ſoon falls into a looſe powder. It turns to a deep red in the fire, makes excellent bricks for building furnaces for melting iron, and even endures the fires of the glaſs-houſes; it alſo makes fine lutes for chemical veſſels. It is met with near Hedgerly, five miles from Windſor, and bears a conſiderable price.

The Deep Duſky Yellow LOAM conſiſts of a deep yellow and a whitiſh ſand, with a very little clay, and is very harſh and coarſe. It is moiſt in the ſtratum, and

and when dried is of a looſe texture, readily crumbling between the fingers without ſticking to the hands. It makes no efferveſcence with aqua fortis, nor does it hiſs when thrown into water. It is uſed for making bricks when mixed with good clay.

The Hard Brown LOAM conſiſts of large white ſand and deep brown clay; it is very hard, but not tough, though it cannot be got up without pick-axes: when dry, it is very hard and heavy, and will not break between the fingers. It will not hiſs when thrown into water, nor make an efferveſcence with aqua fortis. It is often full of ſmall ſea-ſhells; and in Northamptonſhire it is ſo full of them that they make floors for barns therewith; it likewiſe ſerves to make roofs for ovens and other purpoſes.

The Light Pale Brown LOAM is the lighteſt and moſt ſpungy of any of this kind, and is compoſed of fine pale yellow ſand, mixed with light brown clay. When dry, it crumbles eaſily between the fingers, and ſticks a little to the hand. It will not efferveſce with aqua fortis, but when thrown into water makes a little hiſſing, and almoſt immediately falls into a looſe powder.

The Yellowiſh Brown LOAM conſiſts of a white and yellow ſand, together with a ſmall quantity of fine brown clay. It is moiſt in the ſtratum, and when dry is of a looſe crumbly texture, with a rough and ſomewhat duſty ſurface. It makes an efferveſcence with aqua fortis, and hiſſes a little when thrown into water. This ſort alone will make fine red bricks.

The Greyiſh White LOAM is compoſed of a fine white ſand and a pale bluiſh clay, ſpangled with a great number of ſmall plates of talc. While in the earth it is moiſt and ſoft, but when dry is very heavy and compact, with an even ſmooth ſurface; but it will not break between the fingers, nor ſtick to the hands. It raiſes a great efferveſcence with aqua fortis, when thrown into water makes a ſlight hiſſing, and after a little time breaks into ſmall lumps. When burnt it becomes very hard, is of an agreeable reddiſh colour, and will make good bricks when mixed with a proper clay.

The Pale Yellow LOAM is of a looſe ſpungy texture, and conſiſts of ſmall whitiſh ſand with a pale yellow clay. It is pretty tough in the ſtratum, as well as moiſt; but when dry it becomes firm and hard, and is ſpangled with talc. It will not break readily between the fingers, nor ſtick to the hands, nor yet make any efferveſcence with aqua fortis: when thrown into water it makes a very little hiſſing, and ſoon falls into a looſe powder. It is proper for making fine red bricks.

The Yellowiſh Brown LOAM has a very looſe texture, and is compoſed of yellowiſh ſand with fine brown clay. It will not efferveſce with aqua fortis, but it makes a very ſmall hiſſing when thrown into water, where it moulders into powder after ſome time. Mixed with aſhes it is greatly uſed near London for making bricks.

The Reddiſh Brown LOAM conſiſts of a hard whitiſh ſand, and a reddiſh brown clay. It is pretty firm in the ſtratum, and when dry becomes very hard and heavy. It will not efferveſce with aqua fortis, and it hiſſes but little when thrown into water, where it falls into powder after ſome time. This Loam ſerves for making bricks in many parts of England.

The Red Sandy LOAM conſiſts of fine pale yellow ſand, and a bright red clay, mingled with fragments of a very red iron ore, and a great deal of reddiſh duſky ſpar. While it is moiſt it is quite looſe, and of a very deep red; but when dry it is of a pale red, and of a very looſe texture, for which reaſon it crumbles to powder between the fingers. It will efferveſce with aqua fortis, and burns to a fine florid red. The land compoſed of it is very proper for rye, barley and peaſe.

The Brittle Brown Sandy LOAM is an earth partly ſandy and partly ſtony, and when dry will not keep together in a lump, the texture being ſo looſe and ſpungy. It makes a briſk efferveſcence with aqua fortis, and hiſſes pretty much when thrown into water. Thoſe lands that conſiſt of this are accounted poor and barren.

The Greyiſh Brown Sandy LOAM is compoſed of ſmall white ſand mixed with pebbles, and is full of cavities which are ſmooth and gloſſy at the bottom. It is pretty tough and very heavy, and has a rough rugged appearance, without any duſt on the ſurface. It does not readily crumble to powder, nor does it ſtain the hands. It makes little or no hiſſing when thrown into water, nor does it efferveſce with aqua fortis. Land conſiſting of this is very good for barley.

The Heavy Yellowiſh Brown Sandy LOAM is compoſed of a great number of different hard particles; a brown gritty ſtone, a yellow ſand, pieces of ſpar, and a very glittering bright white ſand, with a browniſh ſpungy earth. It is hard, heavy and ſomewhat tough, and in dry ſeaſons breaks into very large maſſes, though it is of a very brittle looſe texture. It is very duſty and hard when dry, and very ſticky in wet ſeaſons, which renders the walking on it very ſlippery and troubleſome. It makes a conſiderable efferveſcence with aqua fortis, and burns to a pale red with very little hardneſs. Some of theſe laſt are more properly called Moulds than Loams, though they are placed in the ſame claſs.

CHAP. VI.

Of OCHRES.

LIGHT Brittle Pale Yellow OCHRE is between the colour of brimſtone and what is called a cream colour, and is of a looſe crumbly texture, it being compoſed of very thin fine plates. It is extremely light, and ſeparates into flakes, in the fire, of a dull reddiſh brown colour. It is found in Pennſylvania and Virginia, and with water makes a ſtraw colour, but with oil a pleaſant yellow.

Hard Heavy Pale Yellow OCHRE is well known to the painters, and is of a cloſe, compact, firm texture, with a ſmooth even ſurface; when burnt in the fire it turns of a dull pale red, and becomes conſiderably hard. It is found in ſeveral parts of Europe, and particularly in Somerſetſhire.

Light Crumbly Yellow OCHRE is commonly ſeen at the mouths of the ſprings of the Spa kind, and at preſent is made very little uſe of; nor can it be expected in any large quantities. In the fire it turns to a pretty good red.

Light Brittle Gold Coloured OCHRE is found in ſmall lumps in the earth, and is very light, being of a crumbly texture, and ſtains the hands of a true gold colour. It turns to a bright red in the fire, and becomes a little more hard. It is common among gravel in ſeveral parts of the kingdom, particularly on Mendip Hills, where it lies in the clefts of the ſtrata. It is alſo in a gravel pit on the right hand of Oxford Street, about a mile from London. When burnt it turns to a red, and might probably be of uſe to painters.

Light Plated Saffron Coloured OCHRE is ſometimes found making a ſtratum, and ſometimes in the perpendicular clefts of other ſtrata, and is of a ſoft crumbly texture, with a rough and even ſurface, but colours the hands with a very beautiful yellow. It burns to a duſky red, and is common in Northamptonſhire and Staffordſhire.

Common Yellow OCHRE is a denſe heavy earth, of a dull yellow colour. It ferments pretty much with

with aqua fortis, and burns to a pretty good red. It is greatly uſed for houſe painting.

Hard Heavy Clavey Yellow OCHRE is very compact, and when dry is of a very fine bright yellow, with a ſmooth gloſſy ſurface. It burns to a red, but crackles in the fire. It is found in Buckinghamſhire and Yorkſhire, and is ſometimes uſed by the painters.

Stony Hard Heavy Yellow OCHRE is in great plenty about Oxford, but it is ſo hard that it is not to be cut with a ſpade, and therefore they are forced to uſe pick-axes. It crackles a little in the fire, and turns to a fine red. It is uſed by the painters.

Dull Duſky Yellow Clayey OCHRE is found in ſeveral parts of England, and is denſe, compact, and heavy. It is of a duſky unpleaſant colour, though it burns to a very fine pale red, and becomes almoſt as hard as ſtone.

Light Clayey OCHRE, of a browniſh yellow, is ſometimes found among other ſtrata, and in their perpendicular clefts. The ſurface is ſmooth and gloſſy, and the texture very fine; it burns to a dead duſky browniſh red. It is found in ſeveral parts of England, and being of a good body is uſed by the painters.

NAPLES YELLOW is of a bright beautiful colour, between that of gold and ſaffron; but it is very looſe, ſpungy, brittle, and porous, and ferments pretty briſkly with aqua fortis. When burnt it turns to a deeper yellow, and is found in Italy, particularly about Naples. It is generally eſteemed a pretty good colour.

Brittle Heavy Red OCHRE is common in ſeveral parts of England, and is of great uſe among the painters. It crackles a little in the fire, where it becomes more hard, and of a paler colour. It is uſed by painters for priming the coarſer ſort of works.

Brittle Purple OCHRE is common in Spain, of a very fine colour, and, though of a looſe texture, weighs very heavy. It is of a fine deep purple before it is dug up, and when dry it turns red. It is a ſtrong Alkali, and therefore ferments greatly with aqua fortis; in the fire it turns to a paler colour.

INDIA RED is a very fine purple earth, of a firm, compact, and hard texture, it being heavy, and almoſt as hard as a ſtone. Before it is dug up it is of a blood colour, but when dry of a fine glowing red, and is full of bright glittering particles of a whitiſh colour. In the fire it burns to a greater hardneſs without much changing the colour. It is found in the Iſland of Ormus in the Gulph of Perſia, from whence it is by ſome called the Perſian Earth.

Bright Red Brittle OCHRE in found in Bengal in the Eaſt Indies, and though uſed in France is not much known in England. It is of a fine, bright, florid red, and pretty heavy, though it crumbles between the fingers, and ſtains the hands. It ferments with aqua fortis, but undergoes little alteration in the fire.

VENETIAN BOLE is a ſort of an Ochre, and is well known among painters, it being of a fine bright pale red, being pretty nearly of the colour of Red Lead. It grows harder when burnt, but the colour is worſe. It is brought hither from Venice.

Pale Red OCHRE is light, brittle, and of an alkalious nature, for it ferments very briſkly with aqua fortis. It ſomewhat reſembles the Venetian Ochre, only it is brighter, and of a little paler colour. It is found in Florida, and is very probably in other parts of America, though it is not much known in England.

Pale Red Clay OCHRE is found in North America, and, though pretty heavy, is of a looſe, brittle texture. It is nearly of a fleſh colour, and burns to a good red in the fire. It is at preſent made no uſe of.

EARTH of Sinope is ſo called from a town of that name in Natolia, and is a ſort of a Bole, ſometimes of a deeper, and ſometimes of a paler colour. It has been ſometimes uſed in medicine, on account of its being of a drying nature, and particularly in fluxes of the belly.

Red CHALK is of a very denſe compact ſubſtance, and is of a dull red colour. Some uſe it in the manner of crayons, or rather like black lead pencils. It is very well known to painters, and therefore needs no farther deſcription. It is found in ſeveral parts of Europe, and particularly in Flanders.

Red Stoney Ochre is the hardeſt and drieſt of any of this kind, and is found in regular ſtrata in the earth, but is ſo hard that it cannot be got up without pick-axes. It is of a fine purpliſh red, and is very heavy, being mixed with fragments of Lead Ore, of a bright bluiſh colour; as alſo a ſmall quantity of pure native Cinnabar. It burns to a fine red, and becomes more hard in the fire. The painters call it Indian Stone Red, it being brought from China; but it is very ſcarce.

Brown UMBER is a ſort of Ochre, and is greatly uſed by painters. It is found looſe in ſmall lumps among gravel, and ſometimes in the perpendicular clefts of other ſtrata. It is very light, though of a cloſe compact texture, and burns to a deep brown in the fire. It is generally brought from abroad, there being very little of it in England, though it is thought to be in Mendip Hills in Somerſetſhire.

COLOGN EARTH, commonly called Cullens Earth, is well known among the painters, and is of a duſky brown, with a cloſe, compact, fine texture, but extremely light. It is not at all gritty, and has the taſte of oak bark. Being thrown into the water, it ſwims on the ſurface till it is quite wet, and ſoon breaks into a very fine powder. It is eaſily ſet on fire, and never goes out till it is reduced to pale yellow aſhes; from whence it appears to be of a vegetable nature, owing its origin to wood long buried in the earth. It is brought to us from the city of Cologn.

The ARMENIAN STONE is very opaque, and mixed with green, blue, and black ſpots, ſomewhat in the manner of Lapis Lazuli. It is of an even, regular texture, and the general colour is a beautiful blue. Some think it differs in nothing from Lapis Lazuli but in hardneſs, and is like that very ſcarce. It was formerly uſed in medicine as a purge and vomit, and the doſe was from ſix grains to a ſcruple; but it is now out of uſe, except among the painters, for when it is prepared it yields a fine blue colour, with a greeniſh caſt.

Green OCHRE, or TINCAL, is of a denſe, compact ſubſtance, though of a coarſe irregular texture, the ſurface being rough and uneven, and the colour of a pale green. It is found in many parts of Germany in and near the copper mines, and it partakes very evidently of copper. By burning it turns to a hard duſky brown Ochre, and therefore is only uſed in its natural ſtate, it being reckoned a very good paint.

Heavy Brittle Black OCHRE is found in maſſes of different ſizes, in the perpendicular clefts of ſtone. It is of a fine deep black, and of a compact, even, cloſe texture, though it breaks very readily into ſmall pieces between the fingers, and ſlightly ſtains the hands. It is common about Mount Sorrel in Leiceſterſhire.

Black CHALK is found in broad flat pieces from two to ten feet long in the earth, and from four to twenty inches in breadth. It is moiſt and flaky when juſt taken out of the ground, but ſoon becomes pretty hard, and very light. It will cleave very eaſily one way, and ſeems to be the offſpring of wood buried in the earth; for it will burn, but not ſo

ſo long as Cologn Earth. It is much uſed in painting, and is to be met with in Spain, Italy, and Germany.

CHAP. VII.

Of BOLES.

A BOLE is a heavy fat earth, which readily adheres to the tongue, and colours the fingers. It is of various kinds.

ARMENIAN BOLE, or BOLE ARMENICK, is ſometimes white, and moderately heavy, being of a cloſe compact texture, and having a very ſmooth ſurface. It is very ſcarce, and therefore being quite unknown to the ſhops it need not be inſiſted upon.

White Brittle BOLE is moderately heavy, with a ſmooth ſurface, though it will crumble between the fingers. It will ferment with aqua fortis, and in the fire may be burnt to a ſort of Lime. It is brought from Germany.

NOCERIAN EARTH is very heavy, and of a greyiſh white, but not ſo brittle as ſome of this kind. It has no taſte, nor does it ferment with aqua fortis. It is met with in Italy, and ſome think it good for the bite of mad dogs, and in malignant fevers.

ERETRIAN EARTH is a fine kind of Bole of a greyiſh white colour, and pretty heavy, with a ſmooth ſurface, though it crumbles very eaſily between the fingers. It ferments very briſkly with aqua fortis, and in the fire it turns perfectly white and as hard as ſtone. When a little wetted and drawn over a copper-plate, it will leave a line behind it, which in a ſhort time turns bluiſh. It is dug up in Negropont, near the antient Eretria, from whence it has its name.

Whitiſh ALKALINE BOLE is hard, of a cloſe compact texture, and like other Boles melts gradually in the mouth. It ferments but ſlightly with aqua fortis, but in the fire turns to a pure white. It is found in the Eaſt Indies.

The Yellow ARMENIAN BOLE is of a ſaffron colour, and of an earthy, heavy, fat, brittle ſubſtance, with an aſtringent taſte, it is of a cloſe compact texture, with an extremely ſmooth ſurface and very hard; but it melts on the tongue, though very ſlowly. It ferments briſkly with aqua fortis, and in the fire becomes more hard, and of a deeper colour.

BOLE of Blois is of a pale yellow, and of a compact texture, but very light, and readily crumbles between the fingers. It ferments violently with aqua fortis, and becomes almoſt as hard as ſtone in the fire, turning to a much darker colour.

BOLE of Tokay is of a yellow colour and brittle, but very fine, and conſiderably heavier than the former. It melts eaſily in the mouth, and ferments violently with aqua fortis; in the fire it becomes conſiderably hard, but does not change the colour.

SILESIAN SEALED EARTH is a ſort of Bole which is pretty heavy, and of a compact texture, with a ſmooth ſurface. It turns to a kind of chocolate colour, in the fire, and becomes conſiderably hard; but is a ſtranger to our ſhops.

LIVONIAN EARTH is a very fine Bole, and very brittle; it is of a dully duſky yellow with a reddiſh caſt, and its ſurface is ſmooth and gloſſy. It becomes of a harder texture and a darker colour in the fire, and is uſually ſealed with the figure of a church, an eſcutcheon, and two croſs keys. It is not only found in Livonia, but in Spain and Portugal, wherewith they make a ſort of earthen ware.

BOHEMIAN BOLE is of a deeper yellow than that of Tokay, it having a ſmall mixture of red. The ſurface is very ſmooth and ſhining, and it melts readily in the mouth.

Red BOLE ARMENICK is the hardeſt of all Boles, and is of a reddiſh yellow colour, not unlike that of ſaffron. It melts readily in the mouth, and has an aſtringent taſte. That is the beſt which will moſt readily beat to powder with a peſtle, or diſſolve in water, without the leaſt ſandy ſediment. Its virtues have been greatly cried up in various diſorders; but it is now ſeldom met with in the ſhops.

FRENCH BOLE is of an earthy ſubſtance, and of a pale yellowiſh red; it is heavy, brittle, and of an aſtringent taſte. It ferments very ſlightly with aqua fortis, and in the fire becomes of a ſomewhat redder colour. It is often mixed with ſand or ſmall ſtones, and therefore it ſhould be mixed with water before it is uſed, and poured off, after the groſſer parts are ſunk to the bottom. It is reckoned a good aſtringent, and is now uſed in the room of all other Boles, but ſeldom alone.

The Sealed EARTH of Striga is of a deep dull red, and has a tolerable ſmooth ſurface. It will crumble between the fingers, and melts readily in the mouth. It ferments a little with aqua fortis, and becomes harder in the fire, without any change of colour.

Red Sealed EARTH of Livonia is conſiderably heavy, though of a looſe texture, and of a paler colour than the red Sileſian Bole. It diſſolves readily in water, and has a ſtrong aſtringent taſte. The fire makes little or no alteration in it.

TUSCAN Sealed EARTH is a heavy pale red Bole, with a ſmooth ſurface, and eaſily breaks between the fingers. It grows hard in the fire, and the colour becomes ſomewhat more dark. It is dug up near Florence, and is ſaid to be good in looſeneſſes and exceſſive bleedings.

PORTUGAL EARTH is a brittle, heavy, fine red Bole of a cloſe texture, with a ſmooth ſhining ſurface. It becomes a little harder in the fire without change of colour, and is very common in the northern parts of Portugal.

TURKY Sealed EARTH is of a greyiſh red colour, and of a looſer texture than ſome other Boles. The ſurface is ſoft and ſmooth, and it breaks eaſily between the fingers; in the fire it becomes conſiderably hard, and of a duſky yellow colour. It is ſaid to be good in the plague, and to promote ſweat. The hard pale red Bole is moderately heavy, and remarkably hard. It is of a beautiful pale red, or rather of a fleſh colour, with a very ſmooth gloſſy ſurface. In the fire it becomes as hard as ſtone, and the colour acquires ſomewhat of a blue. This is found in North America among our plantations.

Pale Brown Hard BOLE is very pure, of a compact texture, and moderately heavy. It conſiſts of thin plates laid cloſely upon each other, and has a ſmooth ſhining ſurface. It cracks and burſts in the fire, flying off in ſmall flakes at firſt; but afterwards becomes conſiderably hard, and of a pale red colour. It is met with in Germany, as well as in America, and in ſome parts of England.

Pale Brown Heavy Denſe BOLE is very compact, and ſpeckled with white and yellow. The ſurface is a little rough, but it may be poliſhed by rubbing. It burns to a duſky red, but does not acquire a much greater hardneſs; it is found in many parts of Germany.

Light Brittle Round Bole is of a looſer texture than others of this kind, and is leſs weighty. It has a ſmooth equal ſurface, but readily crumbles between the fingers. It eaſily diſſolves in water, and is a little aſtringent to the taſte. It becomes conſiderably hard in the fire, and turns to a dark duſky red colour. It is found in ſeveral parts of England.

Greeniſh BOLE is very fine and beautiful, and conſiderably heavy. It is compact, and of a pale duſky greeniſh colour, with a ſmooth gloſſy ſurface. It has a brackiſh diſagreeable taſte, without any remarkable

markable aſtringency. It becomes conſiderably hard in the fire, and turns to a duſky browniſh red. It is found in the Weſt of England.

CHAP. VIII.

Of TRIPOLIES.

SILVER CHALK of the antients is of a ſnow white, and its texture is ſomewhat looſe and ſpungy; for it is very light, and has a rough uneven ſurface. It eaſily breaks between the fingers, and has a taſte like that of Pumice ſtone, but with no ſandy grittineſs. It grows hard in the fire without changing colour, and is found in Pruſſia, where it is uſed for cleaning and poliſhing ſilver veſſels, from whence it has its name.

The Yellow TRIPOLI is of a firm texture, moderately heavy, and is only yellowiſh in the Earth; for when it is dry it becomes white, and almoſt as hard as ſtone. In the fire it turns to a beautiful pale red: it is found in ſeveral parts of Europe; but the greateſt quantity is met with in Africa. It is called Tripoli from a city of that name in that part of the world. This and the former, as well as all of this kind, are compoſed of harder particles than Ochre, for which reaſon they are of greater uſe in poliſhing metals.

Reddiſh White TRIPOLI never makes a ſtratum in the earth of itſelf, but is found in diſtinct maſſes among other ſtrata. It is pretty hard, though of a looſe texture, and conſiſts of a multitude of plates or flakes lying upon each other. It is met with in Germany, and on Mendip Hills in England. It is uſed in poliſhing braſs.

The Melian EARTH of Dioſcorides is a hard, heavy, aſh coloured Tripoli, and is of a looſe, open, ſpungy texture, very readily falling into powder, it being very brittle. It conſiſts of very harſh particles, and is extremely rough to the touch. It has a diſagreeable ſtyptic taſte, ſomewhat like Alum; but the fire makes no great alteration in it. It is found in the iſlands of the Archipelago; but it is not much known in England, and conſequently not uſed by workmen.

Light Brittle Greeniſh Red TRIPOLI is of a looſe ſpungy texture, and remarkably light, with a rough uneven ſurface. It eaſily breaks between the fingers, but does not colour the hands, and undergoes no alteration in the fire. It is found in ſeveral parts of the world, as well as in Somerſetſhire.

ROTTEN STONE is a ſort of Tripoli of a brown colour, and is very ſoft and light while in the earth; but out of it becomes more hard. Its texture is light and ſpungy, and it is dry, hard, and rough to the touch. It becomes a little more hard in the fire, and acquires a reddiſh caſt. It is found in Derbyſhire, Shropſhire, and Somerſetſhire, and is of great uſe in poliſhing braſs.

Hard Pale Brown TRIPOLI has ſometimes a little caſt of red, and is ſomewhat heavy, it being of a cloſe compact texture, and almoſt as hard as ſtone; but it is more ſmooth than other Tripolies. In the fire it becomes more reddiſh. It is found in Wiltſhire, and ſerves for the ſame purpoſes as the former.

Sparkling Brown TRIPOLI is the heavieſt of this kind, though it is of a looſe texture. It ſeems to abound with a ſort of ſpangles that glitter pretty much, though the ſurface is rough and irregular. It ferments briſkly with aqua fortis, and in the fire becomes of a fine red, and pretty hard. It is not very uncommon in England, but has never been put to any uſe.

Browniſh Red Sparkling TRIPOLI is very light, it being of a looſer texture than any of this tribe; but it is full of a great number of large glittering particles, and has a rough irregular ſurface. In the fire it undergoes little alteration. It is found in Wiltſhire, Suſſex, and other parts of England. It is not fine enough to be uſed for any thing elſe but poliſhing Braſs.

CHAP. IX.

Of ISING-GLASS, MOSCOVY-GLASS, and TALC.

ISING-GLASS conſiſts of ſhining ſcaly particles, or flat plates, and that called Moſcovy Glaſs is of the ſame nature; or rather, both theſe names are given to the ſame ſubſtances.

White Shining ISING-GLASS is uſually found in maſſes of a ſmooth and even ſurface, except at the edges; it is ſometimes from eight to twelve inches broad, and from half an inch to three thick. It will cleave into innumerable thin plates or flakes, and is as tranſparent as the fineſt glaſs, inſtead of which it is uſed for putting before ſmall prints generally deſigned for children, as alſo by ſome miniature painters for covering their pictures. They may be ſplit, with care, ſo as not to be thicker than leaf gold, and yet ſtill have a ſort of ſpringineſs or elaſticity, for which it is very remarkable. In the fire it becomes as white as ſilver, but then it ceaſes to be tranſparent. It is found in various parts of the world, particularly in Ruſſia or Moſcovy.

Bright Brown ISING-GLASS is not ſo beautiful as the former; but it has much the ſame texture, and, like that, will cleave into plates or flakes; but the ſurface is not quite ſo even. It is very bright, though not ſo tranſparent as the former, and is more ſubject to flaws and cracks. It ſoon becomes white and opaque in the fire, and then readily breaks to pieces, though it ſeems to be adorned with ſilver ſpangles. It is found in Germany; and it is ſaid, there have been ſmall pieces of it met with in England.

Bright Purple ISING-GLASS is as even and regular as the firſt kind, and may be cloven into as many flakes as that. While the flakes are pretty thick they are of a fine beautiful colour like an amethiſt; but when ſplit into thinner plates it becomes paler, and in the thineſt of all, the colour is wholly loſt. It alſo loſes its colour and tranſparency in the fire, becoming entirely white. It is found in Moſcovy and Perſia, and by ſome it is called Red Talc.

TALC is a ſhining ſtone, and will ſplit into very thin plates, which are tranſparent and a little flexible. It will not melt in the fire, nor will it admit calcination, nor loſe its colour. It is of various kinds.

VENETIAN TALC is well known for the ſeveral attempts that have been made to reduce it into a ſort of paint to beautify ladies facies. Linnæus calls it Whitiſh Talc, conſiſting of plates almoſt tranſparent, which feel like ſuet to the touch. The maſſes of Venetian Talc are from one to five or ſix inches in diameter, with a very rude irregular ſurface, full of prominences and cavities. It is of very little uſe in medicine, it being employed only as a coſmetic to render the ſkin more white and ſhining. The beſt way is to reduce it into an impalpable powder, the ſhorteſt way of doing which is to heat it red hot in the fire, and then quench it in cold water; this muſt be done ſeveral times, after which it may be ground upon a porphyry into an exceeding fine powder ſhining like ſilver. This, when mixed with pomatum, is what the ladies call cold cream. The chemiſts have endeavoured to get the oil of Talc, but without ſucceſs; though they ſuppoſe it would

would turn braſs into ſilver. If any thing of this kind has ever been procured, it has been owing to the additions, and not to the Talc itſelf.

Shining Black TALC, with ſmall leaves, is of an irregular complicated texture, like the former, and is found in maſſes, which have a rugged ſurface from one to four inches in diameter. They are compoſed of a prodigious number of irregular ſcales very cloſely but unevenly laid together, which will eaſily ſplit into irregular flakes. None of the Talcs, nor yet the Iſing-Glaſſes, can be made to ſtrike fire with ſteel, for which reaſon they are called by Linnæus, *Apyri*, that is, without fire. They likewiſe remain unchanged in the fire, and cannot be diſſolved by acids.

Shining Gold Coloured TALC, with ſmall ſpangles, is called by ſome writers *Mica aurea*, from its ſhining like gold. It is found in ſmall maſſes of a looſe, irregular, brittle texture, with an uneven ſurface, but never exceeding an inch and a half in diameter. It is compoſed of a multitude of ſmall flakes or ſpangles, with ſometimes a mixture of a ſort of cryſtal. Theſe flakes are very ſmall, being ſeldom above a quarter of an inch broad; but they are extremely ſmooth and ſoft to the touch. It is found in ſeveral parts of Europe, particularly in England.

Shining TALC, with the appearance of ſilver, has ſpangles of various ſizes, is known to ſome by the name of Glimmer or Cat-ſilver, and is very brittle, readily parting into flakes of which it conſiſts. The maſſes are very ſmall, being ſeldom above the fifth part of an inch in length. It is found in ſeveral parts of Italy, as well as in England, and in ſome places looks like ſhining ſand.

Greeniſh Shining TALC, with very ſmall ſpangles, is of a very pure kind, though it does not ſhine ſo much as the two former; but it is very brittle, and of an irregular ſhape, with a rough ſcaly ſurface. Its maſſes are found from one inch to eight or ten in diameter, which ſeem to be compoſed of very ſmall ſpangles, which will readily ſtick to the fingers in handling. It is found in great plenty on the ſhores of Italy, and there has been ſome found in England, on Mendip hills, but in no great quantity.

Greyiſh Green TALC, with ſmall ſcales, is of a very dull colour, and has a diſtant reſemblance to the Venetian Talc, though the ſtructure is very different. The flakes are of different ſizes, but uſually ſmall, and lie in various directions, being of no determinate ſhape, and they are not ſo tranſparent as the other kinds. It is found on the ſhores of Yorkſhire and Lincolnſhire.

Grey Shining TALC, with very thin ſcales, is rather brighter than any of the former kinds, and conſiſts of a vaſt number of plates or flakes, lying in a very confuſed and irregular manner, and of various ſizes and ſhapes, the larger not being above half an inch in breadth. In the fire it turns as yellow as gold, and ſhines like it, it being the only Talc that changes in the fire. It is very common on the Engliſh ſhore.

Bright Green Shining TALC, with broad ſpangles, is found in maſſes that are compoſed of others that are ſmaller, and theſe conſiſt of very fine thin plates, which are generally wrinkled and turned ſeveral ways. The colour is very beautiful when unbroken; but, when the flakes are ſeparated from each other, it is quite loſt. It is conſiderably heavy, and loſes its greenneſs and tranſparency in the fire. It is found in the beds of rivers in Italy.

Shining Greyiſh Yellow TALC, with ſmall ſcales, makes a very ſplendid appearance, and is found in maſſes of eight or ten inches in diameter, which are compoſed of a great number of very broad, thin, light flakes. The ſurface is bright and gloſſy, but never even. In the fire it loſes all its yellowneſs. It is found very frequently on the ſhores of Italy.

White Sweet-Scented TALC, with undulated ſcales, is by ſome authors called the Violet ſtone, on account of its ſmell. It is found in maſſes of a very compact and firm texture, though rough and irregular on the out-ſide; theſe are from an inch to twelve in diameter; they conſiſt of a prodigious number of thin ſnow-white flakes adhering very cloſely to each other. Theſe are of various ſizes, without any regularity, and lie in all directions, being as ſoft to the touch as thoſe of the Venetian Talc. In the fire it turns to a duſky brown red. It is common on the ſhores of Italy, and on the mountains of Germany.

Beſides theſe, there are other TALCS not ſo eaſily cloven as the former, which conſiſt of ſmall plates in the form of ſpangles, and conſequently are very diſtinct from the former.

The Shining Bluiſh Brown TALC is uſually found in maſſes of a pretty firm compact texture, with rugged unequal ſurfaces, and in the ſhape of pebble ſtones, from the ſize of a horſe-bean to five or ſix inches in diameter. It conſiſts of ſmall, but generally thick ſpangles cohering firmly to each other, and, though irregular, nearly of the ſame ſhape. They are very hard and harſh, feeling more like ſtone than common TALC, and conſequently are hard to be ſeparated from each other. They are very heavy, and yet will not ſtrike fire with ſteel; but the fire will bring them to a pale rediſh grey without tranſparency.

Dull Pale Red TALC, with ſcales of various ſizes, is uſually found in maſſes from two to eight inches in breadth. It is compoſed of a vaſt number of ſcales that lie cloſely together in a very agreeable order; but they are mixed with an opaque ſubſtance of the ſame nature with the ſcales, only they are not of the ſame ſhape, nor well diſpoſed: They ſeem to have very ſmooth and even ſurfaces, and are as ſmooth to the touch as Venetian Talc, to which they ſeem to have ſome diſtant relation. Though this Talc is conſiderably heavy, it will not ſtrike fire with ſteel, but will turn in the fire to a pale whitiſh grey. It is very common on the ſhores of Lincolnſhire.

The Eaſt-Indians have a Heavy, Shining, Orange-Coloured TALC, which has a ſmaller number of plates than any of the other kinds. They have likewiſe another bright purple Talc, which is ſo clear and elegant, that it might not improperly be placed among gems.

There are other TALCS that ſeem to be chiefly compoſed of fibres or filaments, and are, therefore, by authors called fibrous Talcs.

ENGLISH TALC, ſo called in the ſhops, is of a coarſe, harſh, rough kind, with an unequal ſurface, and of a looſe brittle texture. It is found in maſſes from one to eighteen inches broad, and ſeldom more than two inches thick. It has a rough, irregular, wrinkled ſurface, and conſiſts of conſiderably long coarſe fibres, that run pretty regularly through the whole maſs. It may be eaſily cloven according to the directions of the fibres, which, however, are ſo brittle that they ſeldom come off whole. It is of a dull, dead, whitiſh colour, and the filaments, when ſeparated, appear a little gloſſy. It will not ſtrike fire with ſteel, but when calcined it turns to a perfect white. It is found in clay and marl pits, as well as among the ſtrata of gravel, and the fiſſures of ſtone, and it will burn into a very good plaſter, for which reaſon it is called the plaſter ſtone; when burned it is uſed for cleaning ſilver lace.

Gloſſy Yellowiſh White TALC, with broad ſtraight fibres, is of a very cloſe texture, and is found in thick flat maſſes of a very beautiful ſtraw colour, but is ſeldom three inches over either way. It is compoſed

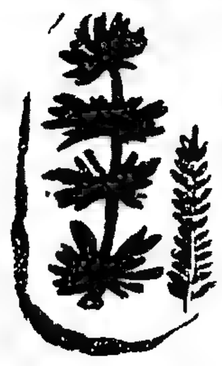
FOSSILS.

Class VI. Extraneous Fossils.

Plants in Stone.

American Fern

Horsetail



Stellate Plants

Ear of Corn

Leaves of Trees

Mosses

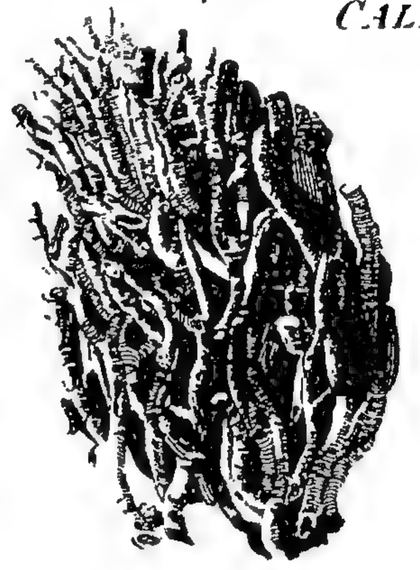
Class VII. Vegetals.

PORPITES

PORUS

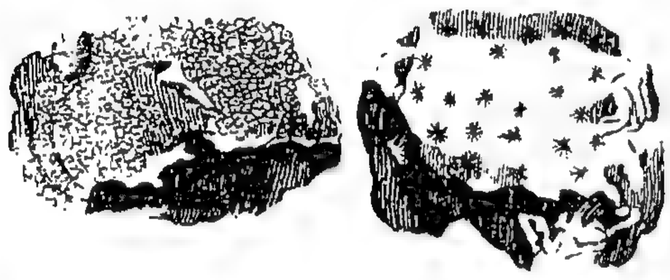
TIBULARIA

JUNCI Lapidei.

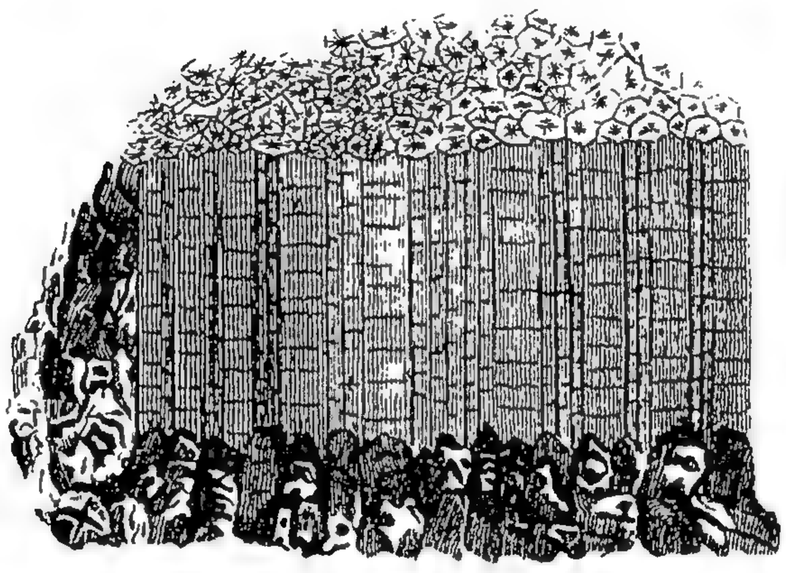


CALAMUS Indicus

Asteites or STAR Stone.



LITHOSTROTION

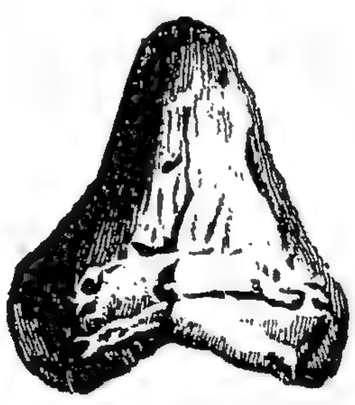


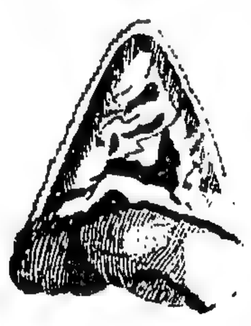
CORAL

MYCETITES

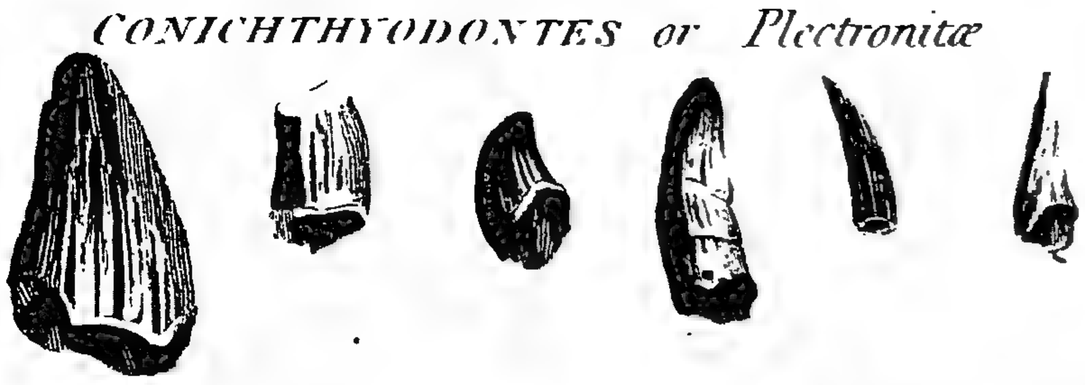
Class VIII. Fishes Teeth.

GLOSSOPETRE or Lamodontes.





CONICHTHYODONTES or Plectronitæ



BUFONITÆ or Lycodontes

ICHTHYPERIA or Siliquastra

London: Published by Alex.r Hogg, at the Kings Arms, N.o 16, Paternoster Row.

J.G.Wooding sculp.

compoſed of filaments that are perfectly ſtraight, and may be very eaſily cloven; but the fibres cannot be divided ſingly from each other, being ſo very brittle. It turns in the fire to a pure white, and is found in the ſtone pits of Northamptonſhire.

Bright white TALC, with broad filaments, is of a looſe brittle texture, and is found in large broad and pretty thick white maſſes, and where freſh broken it is very gloſſy and bright. The filaments are much broader at the top than at the bottom of the maſs, it being above an inch upwards, and very even and gloſſy; they may be cloven very thin, but they will not bend, having no ſpring. It calcines in the fire to a white plaſter, and is very plentiful in the alum pits of Derbyſhire.

Fleſh-coloured Fibrous TALC, with narrow filaments, is not ſo bright as others of this claſs; but it is of a fine ſmooth cloſe and compact texture. Its horizontal ſurfaces, formed by the ends of the fibres, are ſmooth and even, but not gloſſy. The maſſes are from three to twelve inches broad, and ſometimes five inches thick. It conſiſts of ſingle fibres, which run throughout the whole length of the maſs without interruption; but they are very brittle, though ſmooth and gloſſy. It will eaſily calcine in the fire, and will turn into very good plaſter. It is chiefly found in Yorkſhire.

Dull White TALC, with very ſharp narrow filaments, is of a very compact firm texture, though it is only found like white veins in other ſubſtances, particularly red marl. The fibres are of various lengths, but they are all continued without interruption through the veins, and are from the breadth of a horſe hair to half an inch. It will not eaſily cleave, and when it does, it is not perfectly ſtraight, becauſe the filaments run a little obliquely.

The Greeniſh White Gloſſy TALC, with ſtraight narrow filaments, is of a perfectly even and regular texture, being very firm, compact and hard. It is found in broad thin maſſes of a fine gloſſy white, with a greeniſh caſt, from two to fourteen inches broad, and to an inch and a half thick. When held up to a good light it is pretty tranſparent, and in the fire turns perfectly white.

CHAP. X.

Of FOSSILE SUBSTANCES that are not elaſtick, and compoſed of ſhort Fibres.

SOME authors call theſe Lachnides, from *Lachne*, a Greek word, ſignifying hair or down.

The Fleſh-coloured Pale Gloſſy LACHNIS, with ſhort, broad, and crooked filaments, is found in very broad flat maſſes of a whitiſh fleſh colour, which have a very ſmooth, even, and ſomewhat gloſſy ſurface at the top and bottom; ſome of them are eight or ten inches broad, and from one to four thick; and they are compoſed of flat broad filaments, irregularly placed, and lying in oblique angles. Theſe maſſes will cleave perpendicularly according to the direction of the filaments, though they adhere pretty cloſely together at their ſides, and have very ſmooth gloſſy ſurfaces. They will neither ferment with aqua fortis, nor ſtrike fire with ſteel; but in the fire they will turn to a perfect whiteneſs. It is found in the marl pits of Derbyſhire, but is of little uſe.

Greeniſh-White Gloſſy LACHNIS, with broad oblique filaments, is found in large, broad, thick maſſes, with its horizontal ſurfaces very uneven, rough, and rugged. It is ſometimes ſeen near two feet broad, and ſix or ſeven inches thick. It conſiſts of pretty bright gloſſy filaments that are very broad, but placed in no regular order, nor continued through the whole thickneſs of the maſs, which ſeparate it tranſverſely into ſeveral rows, ſeparated by narrow veins of greeniſh white marl. The whole maſs is eaſily cloven and ſeparated into tranſparent filaments that will not bend. When in the fire it ſoon calcines to a white plaſter.

Dull Greyiſh White LACHNIS, with thick oblique filaments, is of an extremely compact and firm texture, and is found in very large, thick maſſes, from two to eighteen inches in diameter, and nearly as thick the other way. It is compoſed of eight or twelve rows of filaments, ſometimes making angles with each other. It is not eaſily cloven, the filaments being ſo harſh and brittle, that they are ſeparated with difficulty to any tolerable length. It is very heavy, and yet it will not ſtrike fire with ſteel, nor will it very eaſily calcine into plaſter.

Dull White LACHNIS, with ſtraight broad filaments, is of a pretty cloſe texture, and extremely brittle. It is found in ſhort thick maſſes, from two to ſix inches in breadth, and ſometimes four inches thick. It is only compoſed of two rows of filaments that are pretty broad and very irregularly placed, meeting each other at the centre; they are ſo extremely brittle that they can never be cloven directly. It will turn to a very good plaſter very ſoon in the fire, and is found in the marl pits of Derbyſhire.

The White Gloſſy LACHNIS, with broad oblique filaments, is of a very irregular texture, but very gloſſy. It is found in large flat maſſes, from two to ten inches broad, and from half an inch to above an inch thick. It conſiſts of ſeveral rows of very broad glittering filaments, confuſedly woven with each other at their ends, and they are all very ſhort and broad, though bent and waved in different manners, making all ſorts of angles with each other. It is hard to be cloven, nor can the filaments be eaſily ſeparated, they have ſo firm a conſiſtence. They are ſoon turned by fire into a fine white plaſter. It is very common in Yorkſhire in the blue clay pits.

Dull Fleſh-coloured LACHNIS, with broad, ſhort filaments, is very brittle, and of a coarſe, harſh, irregular ſtructure. It is often found from eight to twelve inches broad, and ſix inches thick. It conſiſts of broad, ſhort, and very obliquely ranged filaments, divided into three or four beds, by the thick horizontal earth it is lodged in. The filaments are ſhort and crooked, and adhere ſlightly to each other on the ſides, which render the maſs very brittle and eaſily cloven. It is eaſily burnt into plaſter, and is found in the alabaſter pits in Derbyſhire.

The beautiful Fleſh-coloured gloſſy LACHNIS, with ſlender filaments, interwoven with each other, is of a very ſhort, fine, ſmooth, equal texture, and is extremely firm, compact, and hard. It is found in flat maſſes, from four to ſix inches broad, and ſeldom above an inch thick. There are four or five rows of fibres that go to the making up leſs than an inch in thickneſs. It is difficult to cleave, the filaments being not eaſily ſeparated from each other. It may be calcined very ſoon to a fine white plaſter. It is found in Somerſetſhire and other places.

The Bluiſh-White LACHNIS, with very narrow ſtraight fibres, is of a fine ſmooth texture, and pretty compact; it is found in flat maſſes from ten to fourteen inches in breadth, though ſeldom above an inch thick. It is compoſed of three or four rows of orders or filaments ſtanding perpendicularly on each other; theſe filaments being ſtraight render the maſs eaſy to be cloven or ſplit, and they have pretty ſmooth gloſſy ſubſtances. They ſoon calcine to a very white plaſter. It is found in the marl pits of Staffordſhire.

The Gloſſy Greeniſh-Grey LACHNIS, with broad and very thin filaments, is found in maſſes

four or five feet in breadth, being ſeldom above four or five inches thick. They conſiſt of two rows or orders of filaments that are interwoven with each other at their internal ends; but they are always bent, and often placed obliquely. It will calcine, though but ſlowly, to a very white plaſter.

The Gloſſy Greeniſh-White LACHNIS, with narrow bent filaments, is found in maſſes frequently as thick as broad, being ſometimes no more than an inch in diameter, and at other times twelves inches. It is compoſed of many rows of interrupted filaments, variouſly bending and interſecting each other, which have very ſmooth unequal ſurfaces; though they are very hard and heavy, they will not ſtrike fire with ſteel, and they calcine very ſlowly in the fire. It is found in the marl pits of Derbyſhire. All theſe Lachnides may be accounted a ſort of Talc, or at leaſt akin thereto.

CHAP. XI.

Of FOSSILS, called ASBESTOS and AMIANTHUS.

MOST authors that have treated upon foſſils make Aſbeſtos and Amianthus to mean the ſame thing; that is, what ſome call Earth-flax, and others Plumous Alum; but this laſt name has been very improperly applied: for the Plumous Alum is a real ſalt, which is found in an iſland in the Archipelago, called Melo. However, Linnæus makes a diſtinction between Aſbeſtos and Amianthus; for he would have the latter to conſiſt of longitudinal fibres, and the former of thoſe that are interwoven.

Incombuſtible flax is a ſort of Amianthus, and conſiſts of flexible fibres, like thread, lying parallel to each other, and eaſily ſeparated. The ancients ſpun theſe fibres, and made a ſort of cloth thereof, in which they wrapped up the dead bodies they intended to burn, that they might preſerve the aſhes; for, when the body was burnt, the cloth remained entire. The Germans call it mountain flax; and it is found in Lapland, Siberia, and in the vallies of the Pyrenean mountains; but the largeſt quantity is brought to us from Negropont. When handled it cauſes an itching in the ſkin, and ſometimes bliſters, which is owing to the fibres or down, of which it is compoſed, getting into the ſkin; however, it is eaſily cured, by rubbing the part with oil, which will ſoon blunt the points of the down.

There is another Amianthus, with angular, rigid, and opaque fibres, which ſome call Aſbeſtos, with hard parallel fibres, not to be ſeparated from each other. Theſe are of an aſh colour, and the whole has pretty much the appearance of wood. It is found in Lapland, Sahlberg, and other places. There is another Amianthus, conſiſting of ſtiff fibres that are eaſily ſeparated from each other; but they are as brittle and tranſparent as glaſs, and of a greeniſh colour. A fourth ſort is known in the ſhops by the name of Plumous Alum, and conſiſts of exceeding brittle parallel fibres, that can hardly be ſeparated from each other. It is found in Sweden.

Linnæus has alſo three ſorts of Aſbeſtos; namely, that which is heavy, and conſiſts of hard fibres, formed into a ſort of flakes or plates. It will readily cleave, and is of a pale colour; but is ſo heavy it will not ſwim in water. The Swedes call it mountain flax. Another Aſbeſtos is membraneous; that is, it conſiſts of fibres ſo interwoven, that it reſembles old leather. It will ſwim upon water, and the ſurface of it is hard, ſmooth, light and white. The third ſort conſiſts of flexible fibres that croſs each other irregularly, and is ſo light that it is called by the Swedes mountain-cork; indeed, it looks like the inward bark of cork, and is ſo porous a ſtone that it will ſwim in water.

Other authors have the Greeniſh Aſbeſtos, which is extremely ſmooth, firm, compact, and exceeding ſoft to the touch. It is found in the form of veins in a ſort of marble, and its filaments are ſlender and bent. It is met with in the iſle of Angleſea, and other parts of Wales, in lumps, ſeldom larger than a nut.

Whitiſh-Brown Silky ASBESTOS is called in America petrified wood, its texture being even, regular and cloſe. It is extremely ſoft and ſilky to the touch, and of a whitiſh-brown colour. It conſiſts of long continued flat filaments, and is found from one to three inches long.

Greyiſh Silky ASBESTOS, with very long continued and roundiſh fibres, which run in ſtraight lines the length of the whole maſs, is found in lumps from two to nine inches long, and the fibres are ſo placed as to make it look like a piece of wood. It is found in the Highlands of Scotland.

Greyiſh-Green Silky ASBESTOS, with long continued and very ſlender fibres, is found in the iſle of Cyprus, in bits not exceeding a quarter of an ounce in weight, though ſometimes three inches long, and half an inch broad.

White, Looſe, Thready ASBESTOS, with broad fibres, is found in length from two inches to twelve; and ſometimes the fibres ſeem to be bundled up like the threads of cotton in the wicks of lamps. This is found in the Highlands of Scotland.

Soft, Reddiſh-Black AMIANTHUS, with ſhort, abrupt filaments, is found in the ſtrata of iron ore, ſometimes forming veins of an inch in diameter, but ſeldom ſo large. In the fire it turns to a very pale red. It is common in Germany among iron mines.

Greyiſh-Green, rigid AMIANTHUS, with ſhort, abrupt, and interwoven fibres, is ſaid to be the Plumous Alum of the ſhops; though Linnæus affirms it is an Aſbeſtos.

CHAP. XII.

Of the FOSSILS called GYPSUMS.

AUTHORS are not well agreed what Gypſum properly ſignifies; for ſome would have it to be the lime of alabaſter, others a ſort of plumous alum, others iſing-glaſs, and others again the lime of the ſtone called Selenites; but it is more generally taken for the lime of certain whitiſh ſtones, which when burnt, contain ſome ſhining particles like Talc, and which are required to be but a ſhort time in the fire before they turn to lime. But the Gypſum that is meant here includes thoſe ſort of foſſils that are compoſed of ſmall flat particles, which are ranged irregularly, and give the whole maſſes ſomewhat of the appearance of ſofter marble, they being bright, gloſſy, and in ſome degree tranſparent. They will very eaſily turn to lime in the fire.

Hard white GYPSUM, or plaſter of Paris ſtone, has ſomewhat the appearance of loaf ſugar, it being pretty fine, and of a very cloſe, firm, compact texture. It is found in maſſes from four inches to four feet in diameter, and, when broken, ſhines like cryſtal. In the fire it readily turns to a very fine plaſter. It is chiefly found in France.

Hard Shining red and white GYPSUM, that has the appearance of marble, is found in maſſes four or five feet in breadth, and three in thickneſs, with a rough, duſky, dark ſurface; but when broken it is bright and gloſſy. It does not turn into plaſter, when calcined, ſo ſoon as the former. It is common in Yorkſhire and Derbyſhire.

FOSSILS.

Class I. Native Fossils

Amianthus

Asbestos

Lachnis

Tricheria

Elasmis

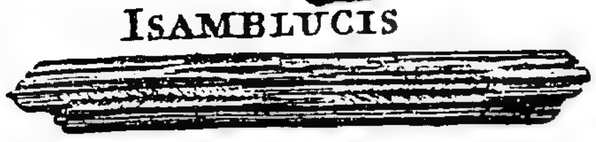
Bractearium

Hyalina

Specularis

Class II. Selenitæ

Isamblucis

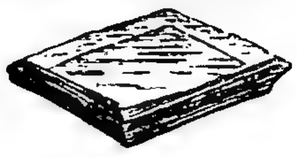


Ischnamblucis

Tetradecarhombis

Pachodecarhombis

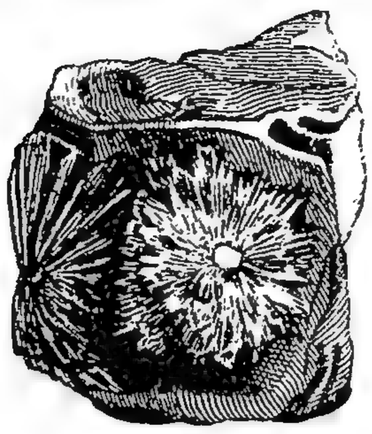
Leptodecarhombis



Cathetolipes

Sanidium

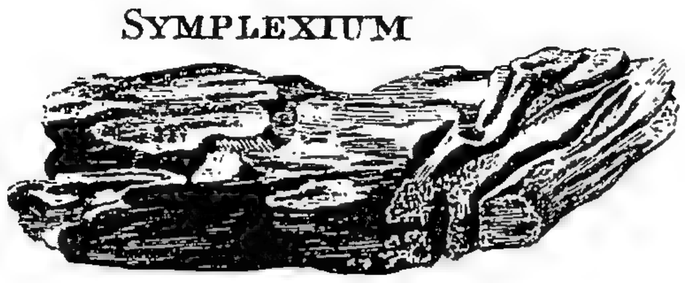
Lepastrum



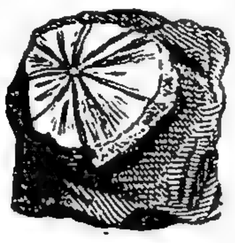
Inoxucia

Oxucia

Symplexium



Trichestrum



Class III. Crystals

Oligaedrum

Elipomacrostylum

Elipsochystylum

Polyaedrastylum

Paubraedrastylum

Brachytelostylum

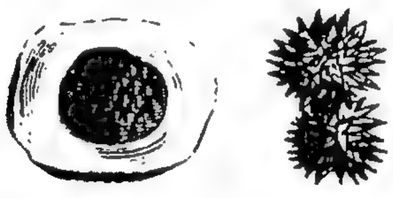
Macrotelostylum

Molybdion

Siderion

Cassiterion

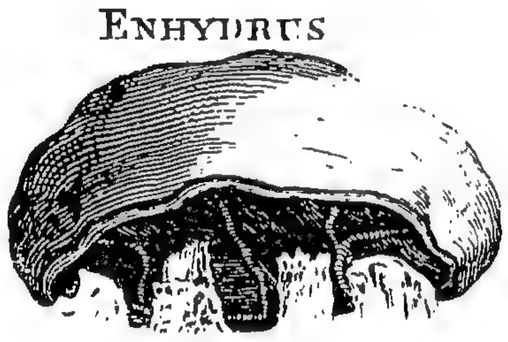
Arthrodia



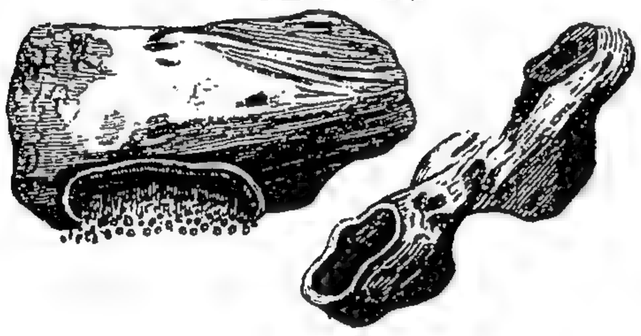
Pangonium

Class IV. Siderochitæ

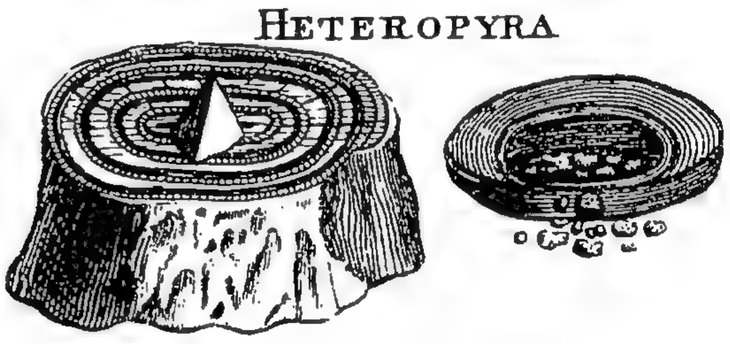
Enhydrus



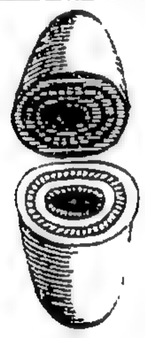
Geodes



Heteropyra



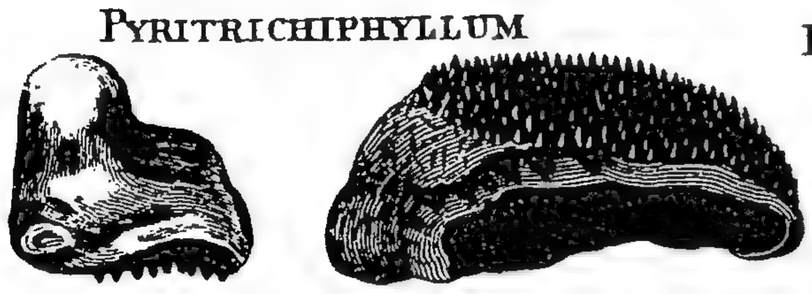
Empherepyra



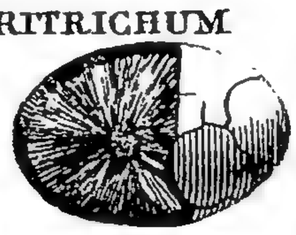
Class V. Pyritæ

Pyricubium

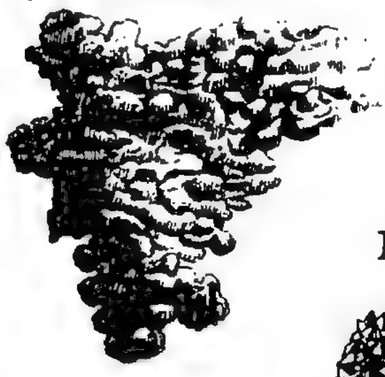
Pyritrichiphyllum



Pyritrichum



Gymnopyris



Pyriplacis

Pyroctogonia

Ætites

Pyripolygonium

Cross Stones

Lepidotes

Pisolithos

Dendritis

Basaltes

Oculatus Lapis

Oculus Beli

Published by Alex.r Hogg at the Kings Arms N.o 16 Paternoster Row.

Smith sculp.

Hard Greyiſh-white GYPSUM is found in maſſes about ſix or ſeven inches broad, and three thick, with very rough, rugged, uneven ſurface, and a coarſe, dull, dead look; when broken it does not ſparkle like the other kinds. It is common in Germany and Derbyſhire.

Soft, Shining, Green GYPSUM is found in lumps four inches broad, and more than one thick. It is of a very dull, duſky browniſh colour on the outſide, but when broken is very gloſſy, though it ſeems to be a little ſpungy. It is very ſoft and brittle, and loſes its fine colour before it is quite calcined in the fire. It is found on the ſhores of rivers in the Eaſt-Indies.

Soft White GYPSUM, commonly called Derbyſhire plaſter ſtone, is found in lumps from the ſize of an egg to two or three feet in diameter, which are opaque, and of a duſky browniſh-white; but, when broken, pretty bright and gloſſy. It is of ſo ſoft and brittle a texture, that it will break with a ſmall force. It becomes very white when calcined, and makes a very valuable plaſter. It is found in many parts of Derbyſhire.

Soft, Pale-brown, Gloſſy GYPSUM, is generally found in thin maſſes, ſeldom above a foot broad, and three inches thick, with a rough unequal ſurface; but, when broken, it has the appearance of marble, being extremely bright and gloſſy, and compoſed of very large broad particles. It is very ſoft and brittle, as moſt of this kind are, and readily calcines into a pure white plaſter. It is found in ſome parts of Germany as well as in Derbyſhire.

Soft Red GYPSUM is ſometimes met with in ſmall lumps, not much bigger than a walnut, at other times in maſſes of ten pounds weight, with a very rough, dull, unequal ſurface; when broken, it ſparkles, but not very much. The texture ſeems to conſiſt of different rows of ſhort lines or ſtreaks, variouſly interſecting each other. It is very brittle, and calcines very eaſily in the fire, making an excellent plaſter. None of theſe Gypſums will ferment with aqua fortis, or ſtrike fire with ſteel.

CHAP. XIII.

Of the SELENITES.

THE Selenites are ſtones conſiſting of ſlender fibres, ranged in fine even flakes of different forms, according to their kinds. They will cleave like Talc, not only horizontally but perpendicularly; and though they will bend a little, they have no ſpring. They will not ferment with aqua fortis, nor readily calcine in the fire.

The Thin, Fine, Tranſparent SELENITE, with tranſverſe ſtreaks, is a common ſort, and is met with from one tenth of an inch to five or ſix inches long. It conſiſts of fine thin plates irregularly diſpoſed through the whole breadth of the maſs. Theſe plates or flakes eaſily ſeparate from each other in an horizontal direction, being almoſt as apt to cleave as Talc. It is pretty ſoft, and as void of colour as cryſtal; in the fire it turns to a pure opaque white. It is formed in the ſtrata of clay in ſeveral parts of England.

The Thin, Dull, Opaque, Slender, Streaked SELENITE, is found from half an inch to three inches in length, and conſiſts of a great number of even flat plates or flakes, each of which is of the ſame ſize as the horizontal ſurface. It is formed pretty much like the former, but not quite ſo regular, nor is the appearance ſo beautiful.

The Thin, Fine, Streaked SELENITE, with longitudinal ſtreaks, is ſeldom broader than an inch, and above a ſeventh of an inch thick. It conſiſts, like the former, of parallel horizontal plates; but the fibres of which they conſiſt, are ſlender, ſtraight and exceeding regular, running in an oblique longitudinal direction, from one end of the ſtone to the other. It cleaves very eaſily, parting into flakes like Talc, and readily calcines to a fine white in the fire. It is found in the clay pit at Richmond, but at a conſiderable depth.

The Thick SELENITE, with tranſverſe ſtreaks and a rough ſurface, is uſually met with of the ſize of about an inch and a half in breadth, and the plates and flakes, of which it conſiſts, are remarkable for the largeneſs of the fibres that compoſe them, as well as the regular order in which they are laid. It calcines in the fire to a perfect whiteneſs, and is common in Yorkſhire and Leiceſterſhire.

The Short SELENITE, with thick plates, is of various ſizes, but the moſt common is two inches in diameter. It conſiſts of a ſmaller number of plates than others of this kind, becauſe they are conſiderably thick, and are compoſed of bundles of fibres running longitudinally, and they are interſected with four or five tranſverſe ſtreaks. The whole ſtone is pretty bright and tranſparent. In the fire it turns to an opaque white, and is very common in the clay pits of Northamptonſhire.

The Tranſparent SELENITE, with narrow tranſverſe ſtreaks, is generally between two and three inches long, and conſiſts of very numerous horizontal plates, irregularly diſpoſed, and of different thickneſſes. They are compoſed of fine parallel ſtraight fibres, running obliquely acroſs the ſtone from ſide to ſide. It very eaſily cleaves into very fine flakes, and calcines in the fire to the whiteneſs of ſnow.

The Thick, Dull SELENITE, with very fine tranſverſe fibres, is generally about two inches long, and conſiſts of fine thin plates, evenly diſpoſed, without the maſs; theſe are made of exceeding fine ſlender filaments, running tranſverſely in an oblique direction through the ſtone. The plates do not ſeparate very eaſily, and the whole maſs is duſky, being very little tranſparent. It is found in the clay pits in moſt parts of England.

The SELENITE, with fine longitudinal filaments, is compoſed, as well as the two former, of two horizontal, and two oblique planes. It is of various ſizes, from a quarter of an inch to three inches in length. It calcines in the fire to a ſnow white ſubſtance, and is very common all over England.

The Brown Tranſparent SELENITE is generally three inches long, and conſiſts of a greater number of fine, tranſparent, firm, parallel plates, joining exactly to each other. The plates conſiſt of many fine filaments, all ranged in the ſame order, and not collected into ſeparate bundles. It may be very readily cloven into horizontal plates that are very thin, and it calcines to a fine white in the fire. It is common in Germany.

The Thin Tranſparent SELENITE, with tranſverſe fibres, is commonly about an inch long, and conſiſts of many thin horizontal plates or flakes, made up of parallel fibres running obliquely acroſs. It cleaves very eaſily, both horizontally and perpendicularly, and readily calcines into a white maſs. It is common in Northamptonſhire, and other parts of England.

The Dull, Thick SELENITE, with very thin tranſverſe fibres, is generally between two and three inches long, and is compoſed of many extremely thin plates, that conſiſt of an infinite number of parallel fibres that are connected into bundles, and run tranſverſely in an oblique direction. It is very brittle, but it eaſily cleaves, according to the horizontal direction; and though it is as bright as the reſt, it is not ſo tranſparent; but it calcines more readily to a perfect whiteneſs. It is found in Leiceſterſhire in the yellow clay pits.

The

The Long Scaly SELENITE is commonly about three inches long, and has its horizontal plains very rough and ſcaly, it being compoſed of a vaſt number of oblong narrow plates, falling very irregularly one over another; it turns in the fire to a pure white.

The SELENITE, with thin flakes and tranſverſe filaments, is generally about an inch in length, and is compoſed of ſix planes that are nearly equal; that is, a top, a bottom, and four ſides. It is conſiderably long, in proportion to its thickneſs, and is compoſed of parallel plates lying evenly over each other in an horizontal direction, each making one whole ſurface of the ſtone. Theſe conſiſt of very fine ſlender fibres, laid obliquely acroſs the flakes. It may be cloven very eaſily, according to the direction of the flakes; and in the fire it turns ſoon into a very pure white. It is ſometimes found in Northamptonſhire.

The Dull SELENITE, with thick plates and longitudinal fibres, is exactly of the ſame ſhape as the former, and is uſually about two inches long, and a little more than a quarter of an inch in diameter. It is of an opaque whitiſh colour; but calcines very ſlowly to a fine white. It is common in clayey grounds in Yorkſhire, lying near the ſurface.

The SELENITE, in the ſhape of a column, with very fine fibres, has ſix angles, and looks as if there was a part broken off at each end. There is no diſtinction of top and bottom, and all the planes are nearly alike. It is uſually about an inch and a half long, and half an inch in diameter, conſiſting of a great number of very bright, and fine parallel filaments. It will cleave every way, but not into flakes, and the filaments are very flexible, but not elaſtick. It turns in the fire to a very pure white, and is found, but not commonly, in the clay pits of Northamptonſhire.

The SELENITE, ſhaped like a column, with thick fibres, may be eaſily ſeparated into filaments, for they will ſplit off from many of its ſurfaces; but they will not bend readily, for they will eaſily break. They are neither bright nor tranſparent, but of a chalky whiteneſs, and turn to a pure white in the fire. It is found in the cliffs in the iſle of Sheppy.

The Colourleſs Tranſparent SELENITE is of no regular ſhape, it being found in thin flat maſſes of different ſizes and forms, that is, from one inch to a foot in length. It is compoſed of a vaſt number of minute and thin parallel flakes, not unlike Iſing-glaſs. They are formed of a multitude of parallel fibres, ranged in a beautiful order. They are extremely bright and tranſparent, and the ſubſtance is very ſoft. It turns in the fire to fine pure white. It is found in ſeveral counties in England.

There is another SELENITE of this kind that is whitiſh and dull, but not ſo pure as the former; but it ſeems to be made up of plain even flakes, like thoſe of Iſing-glaſs. It is commonly long, in proportion to its breadth, but is a little thicker than the former. The ſides are uneven and ridged, like the tiling of a houſe; and it is of various ſizes, being from one inch to ſix or eight long. It calcines ſlowly, but at length attains a perfect whiteneſs. It is common in Germany, and is ſometimes met with in the ſtrata of clay in Northamptonſhire and Leiceſterſhire.

The SELENITE, with eight ſides, is always ſhort and thick in proportion to its breadth, and is from one ſixth of an inch to two inches long; but when it is only an inch, which is the common ſize, it is about half an inch thick and broad. It is compoſed of a vaſt number of pretty thin plates, laid evenly and regularly in a tranſverſe order, and theſe conſiſt of moderately large fibres. The flakes are very flexible, but not elaſtick, and they are all opaque and whitiſh while together. It is found in the clay pits of Staffordſhire.

The SELENITE, compoſed of filaments that are ranged toward the ſurface of the body, into broader plates, which are notched at the edges, and ſeem to be radiated in the form of a ſtar, is bright, and of a browniſh white, and ſeems to be compoſed of fine thin plates, propagated from a ſingle point, which is ſeldom placed in the centre of the maſs, and the whole variouſly jagged. The ſtars are uſually broad and flat, having but little thickneſs in proportion to their extent. This ſtone is of various ſizes, namely, from that of a barley-corn to two inches in diameter. When broken it ſeems to be compoſed of ſtraight, even, and very fine ſlender longitudinal fibres, proceeding from the centre, and form a maſs of a very beautiful ſtreaked texture. In the fire it turns perfectly white, and is found in the iſle of Sheppy.

There are other ſpecies of the Selenite; but thoſe we have already mentioned are fully ſufficient.

CHAP. XIV.

Of CRYSTAL.

CRYSTAL is a ſoft tranſparent gem, that has ſomewhat the appearance of frozen water, and is ſometimes like an hexagon column pointed at each end; or rather ſeems to be compoſed of two hexagon pyramids with a column placed between them.

It is the ſofteſt of all gems, and when it is coloured goes by another name, though it ought not to be ſubſtituted in the room of the more precious ſorts of ſtones. When it imitates a Beryl, it is called a baſtard Topaz, and the like.

Cryſtals, with a long intermediate column, are, the very bright CRYSTAL without any colour, which ſeems to be the moſt perfect kind, and is generally free from all kinds of blemiſh. It is pointed, as mentioned above, and conſequently conſiſts of ſixteen planes or ſides in all; but thoſe on the pyramids are not of an equal breadth, two of them being narrower than the reſt. It is found from the ſize of a barley-corn to three inches long, but the common ſize is an inch. It does not depend upon any other body; but where one is met with there are generally more. It is moderately heavy, will ſtrike fire with ſteel, and when calcined, is of an opaque white. It is commonly met with in the mountains of Germany, but is very rare in England.

Blackiſh Bright CRYSTAL, with ſhort pyramids, is always pure and without clouds. It is of various ſizes, and is moſt commonly three quarters of an inch in length. The number of ſides is the ſame as in the former. It is harder than common Cryſtal, and cannot be broken without difficulty. It is remarkably bright and tranſparent, and has what they call a black water. It is very uncommon, though it is ſometimes found among other ſorts in ſome parts of Italy.

Dull Whitiſh CRYSTAL, with irregular pyramids, has a longiſh and pretty thick column, and the pyramids are longer in ſome parts than in others. It is ſeldom quite an inch long, and is near half an inch in diameter. It will ſtrike fire with ſteel, and calcines eaſily into a pure white. It is common in Germany, and is ſometimes found in Yorkſhire and Cornwall.

Britiſh colourleſs CRYSTAL, with long pyramids, and a ſhort column, is very bright and tranſparent, and the thick ſhort column has long pyramids tapering at the end. It is uſually about an inch and a half long, and three quarters of an inch thick.

thick. The planes are ſeldom regular, but four on the column and pyramid are frequently broader than the other two. It is ſo hard as not to be ſcratched, and is not eaſily broken: When calcined, which it is with difficulty, it is as white as ſnow. It is found in Bohemia.

Bright Brown CRYSTAL, with ſhort pyramids, and a very ſhort column, is always thicker than it is long, and is ſeldom or never either cloudy or foul; it is of various lengths, from the third part of an inch to three inches, and the diameter is always greater than the length. It is generally found in large parcels in the ſame place, and is extremely hard, breaking with difficulty, and in any direction; when calcined, it becomes perfectly white.

Yellow Bright CRYSTAL, with regular pyramids, and a ſhort column, is ſeldom pure, there being cloudy ſpots, films and ſtreaks therein; it is compoſed of eighteen ſides or planes, like the reſt; that is, ſix on each pyramid, and ſix on the column, and is found from a quarter of an inch to two in length. It is conſiderably hard, ſtrikes fire with ſteel, and when calcined is entirely white. It is common in Sileſia and Bohemia, and has been ſometimes found in Yorkſhire.

Bright Colourleſs CRYSTAL, with a ſhort column gibbous in the middle, is a very fine ſort, and has moderately long and ſharp pyramids at the end; it is three quarters of an inch long, and a quarter and a half in diameter, and is found ſingle, though ſometimes it is met with among the ſtrata of ſtones. It is very hard, ſtrikes fire with ſteel, and calcines to the whiteneſs of ſnow.

Dull CRYSTAL, with large pyramids, and an extremely ſhort depreſſed column, is a very foul opaque ſort, and of a coarſe texture, with a continual cloud throughout its whole ſubſtance. It almoſt entirely conſiſts of pyramids without a column, and is found detached from all other bodies, but commonly in conſiderable numbers. It is not ſo hard as common Cryſtal, but will ſtrike fire with ſteel, though not eaſily; and is very white when calcined. It is ſeldom or never found in England.

Small, Bright, Blackiſh CRYSTAL, with regular pyramids, is extremely clear and regularly formed; it is of various ſizes, the largeſt among them not exceeding a ſixth of an inch in length, but many are extremely ſmall. It is very hard, and is calcined with difficulty. It is found in Germany in the cavities of a black fiſſile ſtone.

White CRYSTAL, conſiſting only of two pyramids, which are ſhort, and joined baſe to baſe, is generally very pure, and is always found independent of all other bodies. It is not perfectly colourleſs, it being a little whitiſh; but it ſtrikes fire with ſteel very freely, and calcines very ſlowly.

Brown CRYSTAL, conſiſting of two long pyramids, without a column, is perfectly pure, and regularly formed, and is of different ſizes, from the eighth of an inch to three inches in length, and one third of its length in diameter. It is ſeldom found ſingle, many of them being uſually joined together in an irregular manner; and, when not joined, they are always pretty numerous. It is of a very fine water, and extremely hard, ſtriking fire with ſteel, and calcining ſlowly to a perfect whiteneſs. It is found in Scotland on the ſides of hills, and ſometimes on the banks of rivers.

Crooked or Slanting CRYSTAL, conſiſting of two pyramids, without a column, is perfectly pure and tranſparent, and conſiſts of an oblique, or ſlanting double pointed body, beſides the pyramids being irregular. It is from a quarter of an inch to two inches long, and about three fourths of its length in diameter. It is of a very fine water, and is extremely hard, ſtriking fire readily with ſteel. It is found in the Eaſt and Weſt Indies, and is common in New Spain, where it is highly valued.

Bright Blackiſh CRYSTAL, conſiſting of two very ſhort pyramids, without a column, is a very fine ſort, and appears as bright as any ſtone of this kind. The two pyramids join evenly baſe to baſe, though ſometimes one is a little larger than the other. It is commonly found in lumps, conſiſting of ſeveral of theſe Cryſtals pretty cloſe together; however, at other times, they are looſe and independent of each other. It has a fine blackiſh hue, and is very bright, with a fine water. It is extremely hard, ſtrikes fire with ſteel, and after a long calcination becomes white. It is found in Italy, Germany and France.

CRYSTAL, conſiſting of two pyramids only, with eight ſides each, that is, having ſixteen planes in all, and of a browniſh colour, is of a very uncommon kind; it is fine and clear, though often ſpotted with large blotches of black. The pyramids are much of the ſame length, and the planes are extremely ſmooth; ſometimes a hundred, or upwards, are found together, but detached from each other. It is conſiderably hard, ſtrikes fire with ſteel, and calcines to a pure white. It is found in Virginia, on the ſides of hills, among a ſort of iron ore.

CRYSTAL without colour, conſiſting of two longiſh pyramids, with eight ſides each, is a very pure ſort, and very fine and clear; it is uſually near an inch long, and a third of an inch in diameter, with the planes entirely ſmooth poliſhed and even. It is uſually found ſingle, is very tranſparent, and of a very fine water, as well as extremely hard. It is exceedingly ſcarce, and, as yet, has been found only at Goſlear in Saxony.

CHAP. XV.

Of Imperfect CRYSTALS.

SPRIG CRYSTAL is whitiſh and tranſparent, and has only one pyramid with ſix angles, beſides the column; it is an exceeding common ſort, and is very regularly formed, though it is ſubject to variety of blemiſhes. The column is always long and ſlender, and fixed at one end to ſome ſolid Foſſil, conſequently the hexangular pyramid muſt be at the other end. The length is from a tenth of an inch to ten inches and longer; the planes are irregular, as to length and breadth, and they differ ſo much from each other, that ſcarce any two of theſe Cryſtals are found exactly alike. They are, almoſt always, found in cluſters, are very hard, ſtrike fire with ſteel, and calcine after ſome time, to a pure white.

Bright imperfect CRYSTAL, without a tinge of any colour, is, by many, confounded with the former; but it is different from it, and is often ſold by dealers for a white ſapphire, becauſe it is ſomewhat like it; it is perfectly clear, generally pretty regular, and has a long ſlender column with ſix angles, terminated by a pretty long hexangular pyramid; it is from one tenth of an inch to three or four inches long; but it is moſt commonly about an inch and a half. It is not found in ſuch large cluſters as the former, but is extremely hard, ſtrikes fire with ſteel, and calcines very ſlowly to a pure white. It is found in the Eaſt and Weſt Indies, as well as in Germany; ſometimes it is ſo tinged as to imitate gems, and may be readily miſtaken for them.

Dull Whitiſh imperfect CRYSTAL, with a very ſhort pyramid, is remarkably coarſe and impure, not with having films or clouds, but by being whitiſh throughout its whole ſubſtance; it conſiſts of the ſame planes as the former, and is uſually long in proportion

proportion to its thickneſs in the column; but the pyramid is always ſhort. It is met with from a quarter of an inch to four inches long, and is generally found in large cluſters; but it is not ſo hard as moſt of the reſt; for it will not readily ſtrike fire with ſteel, and yet it calcines ſlowly to a pure white. It is found in moſt parts of Europe, and particularly in Cornwal.

Bright Brown imperfect CRYSTAL, with a long pyramid, is generally known by the name of brown Cryſtal, and has a very fine clear texture. The form is generally regular, it having a long and pretty thick column, and is found from the ſize of an inch to an inch and a half in length, though ſome have been met with ten inches long. It is extremely hard, ſtrikes fire with ſteel, and calcines, at length, to a pure white. It is found in the Eaſt and Weſt Indies, as alſo in Sileſia and Bohemia, as well as in the iſlands of Scotland.

Dull Brown imperfect CRYSTAL, with a ſhort pyramid, is ſometimes miſtaken for the former, though it is not near ſo good, it having a dull and dead aſpect. The column is regular, but always ſlender in proportion to its length, and is from half an inch to fourteen inches long. It is commonly found in cluſters, but the columns do not adhere to each other, as in the former; and its brown colour is of various degrees, for ſome are pale, and others almoſt black. It is tolerably hard, ſtrikes fire with ſteel, but will not readily calcine. It is very common in Germany, and is found in the cliffs of rocks.

Bright Brown imperfect CRYSTAL, with a ſhort pyramid, is often tinged with various colours, but moſt frequently with a pale yellow; it is extremely pure, and of a bright fine texture, though often covered with a rough coat. The column is long and ſlender, and it is generally met with about two inches long, and not quite half an inch in diameter, but the planes are irregular; it is commonly found ſingle, though ſometimes in large cluſters, and is extremely hard; it ſtrikes fire with ſteel, and, after a conſiderable time, calcines to a pure white. It is found in the great mine at Goſslear in Saxony; as alſo in Virginia.

Bright Brown imperfect CRYSTAL, with a very long irregular pyramid, is called the Beryl by ſome jewellers, and has the greateſt luſtre of all the brown Cryſtals; but it is not very large, being only from half an inch to four inches long, and has a thinner column than others of the ſame length. The planes are the ſame in number as in others; it is very hard, ſtrikes fire readily with ſteel, and calcines very ſlowly. It is found in Italy and Germany, and is commonly called by the jewellers, the Beryl Cryſtal.

Whitiſh imperfect CRYSTAL, with a very long pyramid, is, by ſome authors, called the Iris or Rainbow Cryſtal; it is remarkable for reflecting different colours, whence it has its name. It is not very pure, for ſometimes there are large white flaky blemiſhes, but the form is perfect and regular; it is uſually long and ſlender, and moſt commonly about three inches long. It is often met with in cluſters of forty or fifty together; but the columns ſingly touch each other; it is pretty heavy, ſtrikes fire with ſteel, and in the fire readily calcines and turns white.

Bright Yellow imperfect CRYSTAL, with a ſhort pyramid, called Citrino by the jewellers, is very clear, pure, and of a fine texture, it being generally free from blemiſhes, and is from one to five inches in length; but commonly much thinner at the top than near the root. It is moſtly found ſingle, and is of a very beautiful yellow; it is not extremely hard, but it will ſtrike fire readily with ſteel, and calcines ſlowly to a whiteneſs in the fire. It is found in Bohemia and the Weſt Indies, and is made uſe of for ſtones to ſet in rings.

Short, Bright imperfect CRYSTAL, without any colour, may be diſtinguiſhed from all others, by being very ſhort in proportion to its thickneſs; it is almoſt always extremely pure and without blemiſh, and its figure has little variation. It is always fixed to ſome body or other, and is found of various ſizes, from half an inch to three inches long, and the diameter is commonly two thirds of the length. A cluſter of eight or ten of theſe is generally found together, but the columns ſeldom touch, and never adhere. It is remarkably hard, and will admit of a fine poliſh. It is found in New Spain, and other parts of America.

Brown imperfect CRYSTAL, with a rough coat, and five planes on the pyramid, as well as on the column, has a coarſe and opaque coat, but the inſide is never ſubject to any foulneſs. The column is thick and ſhort, and the pyramid pretty long and ſlender; the moſt common ſize is three inches long, and near an inch and an half in diameter, and there are two broad planes on the pyramid, as well as on the column. The root is very ſmall and inconſiderable; and it is uſually found ſingle, of a very beautiful brown, extremely tranſparent; and of a fine deep water. It is very hard, and calcines ſlowly to a pure white. It is found in the Eaſt Indies, and is in high eſteem among the jewellers, it being the fineſt of all brown Cryſtals.

Browniſh-white imperfect CRYSTAL, with a long pyramid, has twenty-four planes; that is, twelve on the pyramid, and twelve on the column. The texture is pretty fine, pure, and clear, though ſometimes ſubject to foulneſs from flakes. It has a regular, pretty long and ſlender column, and is about three inches long, and little more than half an inch thick. The planes are all irregular with regard to breadth, and ſometimes there is a part of them wanting. The root of this kind is long, large and whitiſh, and is uſually found ſingle. It is very hard, and calcines ſlowly into a perfect whiteneſs. It is found in the mountains of Sileſia and Bohemia, as well as on the ſhores of rivers, and is in high eſteem.

Yellowiſh-Brown imperfect CRYSTAL, with a ſhort pyramid, having twelve planes on the pyramid, and as many on the column, is of a pure, perfectly fine ſort, and is ſeldom ſubject to blemiſhes, though there are ſometimes found very ſmall flakes of a whiter ſubſtance. The column is long and ſlender, and the uſual ſize is about an inch in length. The planes are very irregular, with regard to breadth, and the pyramidal planes differ greatly in length as well as in breadth. It is extremely hard, and will calcine at length to a pure white. It is uſually brought over with the Saxon topazes.

Clear Colourleſs imperfect CRYSTAL, with a very ſhort pyramid, and twelve planes on the pyramid, as well as on the column, is extremely clear, pure, and of a very fine texture, without the leaſt ſpot or blemiſh. It is from one to two inches long, and ſome of the plains are broader than the reſt. The ſurfaces of thoſe on the pyramid are perfectly ſmooth, and thoſe on the columns have deep ridges. It is commonly found ſingle, is perfectly tranſparent, and has a fine bright water. It is remarkably hard, and is found in the Eaſt Indies.

Colourleſs, very Bright, imperfect CRYSTAL, with a pretty long pyramid, which has twelve planes, and the column as many, is generally found in cluſters, and is a pure, elegant, regularly formed Cryſtal, though generally very ſmall, it being not above an eighth part of an inch in length, though it has been found half an inch long or upwards. The planes ſeem to be nearly all of a breadth, and of the ſame length, and the top of the pyramid ſtands over the centre of the column; the planes of the pyramid are always ſmooth, having a high natural poliſh, and a

fine lively dark water. It is extremely hard, and is found in all parts of this kingdom, ſometimes ſurrounding a ſingle or double round ball, and at other times in the cracks, cavities, and clefts of flints, and other ſtones.

Blackiſh imperfect CRYSTAL, with very ſhort pyramids, with twelve planes thereon, and as many on the baſe, is thought to be the hardeſt and brighteſt of all the claſs. The column is ſomewhat longer, and the pyramid ſhorter, than in others of this kind. It is ſo extremely ſmall as ſometimes not to be diſcovered, unleſs by its glittering, though there are ſome the tenth part of an inch in length, and a few the third of an inch. It is ſhaped like the former, and has naturally a very fine poliſh; it is extremely hard, and is found in great plenty in the foreſt of Dean in Glouceſterſhire.

Imperfect CRYSTAL, with a blunt pyramid, and a very ſhort column, each of which has twelve planes, is pretty pure and clean, though ſometimes ſubject to ſpots and white opake flakes. The pyramid is blunt, broad, and fixed to a broad ſhort column, that ſometimes ſeems to the naked eye to be wanting. It is extremely ſmall, the uſual ſize being not above the twelfth of an inch in length, and nearly of the ſame diameter. There are various ſizes in the ſame maſs, there being ſmall ones between the larger; but the ſurfaces are very ſmooth and pretty gloſſy. It is found together in large quantities, and is ſometimes tinged with red or yellow. It is conſiderably hard and heavy, and found in Cornwal, Yorkſhire, and other counties of England.

Whitiſh Tranſparent imperfect CRYSTAL is ſomewhat like the common Cryſtal, and, at firſt ſight, ſeems to have the ſame number of planes. It is pretty fine and pure, and is of a perfect regular form, being in the ſhape of a pyramid with four ſides, and is pretty broad at the bottom. It is generally about half an inch high, and almoſt as much in diameter; but there are ſome two inches high. However, it is often met with in large cluſters, and the largeſt ſingle Cryſtal is no bigger than a grain of barley. When it is found ſingle, it always adheres to ſome foſſile body at the baſe, and is principally met with in Devonſhire and Cornwal.

Colourleſs, Tranſparent, imperfect CRYSTAL, conſiſting of ſix planes, is perfectly pure, fine, clear, and broad in proportion to its length. It is very ſmall, being generally of the ſize of a grain of Wheat, and the largeſt is ſeldom more than the third of an inch in length. It is but thin in proportion to the ſize, and ſometimes all the planes are perfectly ſmooth, and ſometimes with ridges, appearing ſtreaked near the extremities. It is ſometimes found ſingle and looſe, and at other times in cluſters that hurt each other. It is extremely heavy, very hard, and is found in pretty large quantities among the iron ores of the foreſt of Dean.

Black, Gloſſy, imperfect CRYSTAL, of a rhomboidal form, is extremely pure, and of a very regular ſhape. It is from a third of an inch to an inch in length, and is bright, ſmooth and gloſſy. The larger ſort is uſually ſingle, and the ſmall are in larger maſſes, of a fine blackiſh colour, and calcines to a fine purpliſh red. It is met with on the ſurfaces of the perpendicular cliffs, in the iron mines of Glouceſterſhire. There are many other ſorts of cryſtals; but to enumerate them all would be tedious and uſeleſs.

CHAP. XVI.

Of SPARS, of various Figures and Shapes.

SPAR, with a narrow oblong pyramid, is very like Cryſtal with eight ſides, and is of a pure fine texture, it being the moſt perfect of all the whole claſs, having a column with ſingle angles, with a pyramid, conſiſting of the ſame number. The column is pretty long, but not thick, and the pyramids are remarkably ſlender and pointed. The common ſize is the twelfth of an inch long, though ſome have been ſeen of three quarters of an inch. The larger ſpecimens are generally found looſe; but they are moſt commonly among the coarſer ſtrata of ſtones, and is ſometimes tinged with a faint purple colour. It will not ſtrike fire with ſteel, but will diſſolve in aqua fortis, and will calcine eaſily in a moderate fire. It is found in the mountains of Germany, and in North Wales.

SPAR, with very ſhort pyramids and a long column, is perfectly pure, and a regularly formed body, conſiſting of a pretty long and thick hexangular column, terminated by a very ſhort pyramid with the ſame number of ſides. It is commonly about an inch long, and the third of an inch in diameter. It will not ſtrike fire with ſteel, but will ferment with aqua fortis, as will indeed every kind of Spar, and therefore this needs not be repeated. It is found in Saxony, and ſometimes in Hartz foreſt.

SPAR, with ſhort pyramids, and a very ſhort column, may eaſily be diſtinguiſhed from others by its ſhape, and is of a pretty pure and fine texture, but not ſo clear as the former. It is generally found in cluſters of eight, ten, and twelve together, and has a duſky hue, with very little tranſparency.

SPAR, with very ſhort and broad pyramids, is extremely pure, and of a perfect fine texture, having a pretty long and thick column, with a depreſſed pyramid at each end, each of which has five ſides. It is ſometimes met with an inch long, but the commoneſt ſort is exceeding ſmall, and is lodged in the ſtrata of clay. It is found in Derbyſhire, Yorkſhire, and Cornwal.

SPAR, with long pyramids and a long column, which conſiſt each of three ſides, is pretty pure, but has a whitiſh caſt and a dulliſh look. It is commonly about an inch in length, and half an inch in diameter. It is conſiderably heavy, but very ſoft and eaſily ſcratched. It is found in Germany, and ſometimes in Cornwal and Devonſhire.

Slender SPAR, with very ſhort pyramids, conſiſting of three ſides as well as the column, is generally pretty pure, and of a fine texture, though ſometimes ſubject to blemiſhes. The common ſize is three quarters of an inch in length, and is of a bluiſh white, but ſometimes approaching to a lead colour, or a yellowiſh brown. It is very ſoft, and is found in England, Ireland, and Germany.

SPAR, conſiſting of two long pyramids without a column, each having eight ſides, is very pure and fine, and commonly about three quarters of an inch long. It is very tranſparent, though it is ſomewhat of a whitiſh colour.

SPAR, with ſhort and ſharp pointed pyramids, each conſiſting of eight ſides and without a column, is very pure, and is remarkable for its ſhort points and broad baſis, and is often found half an inch thick, but never longer than two thirds of its thickneſs. This, as well as the former, is found in Hantz foreſt, in Germany.

SPAR, with long narrow ſharp pointed pyramids, conſiſting of ſix ſides each, and without a column, is generally fine, clear and pure, though ſometimes cloudy. It is often an inch in length, but not a third of an inch in diameter, and is very ſoft. It is found in the mines of Mendip hills.

SPAR, with ſhort broad pyramids conſiſting of three ſides each, and without a column, is very pure, fine, and clear, and is very ſhort in proportion to its thickneſs. It is from half an inch to an inch and a half long, with very ſmooth gloſſy planes. It is pretty tranſparent, and brighter than moſt other Spars,

Spars, as well as harder, though it will not ſtrike fire with ſteel. It is found in Hartz foreſt.

Slender SPAR, with a long pyramid, conſiſting of ſix ſides, has often been miſtaken for a Cryſtal, it having a long ſlender hexangular column. The texture is extremely fine, though it is ſometimes ſubject to flaky flaws, and is commonly two inches long, and a third of an inch in diameter. It is not ſo bright as Cryſtal, and is ſometimes of other colours, which are very lively and beautiful like gems; but it is ſoft, and found in Mendip hills.

SPAR, with a very ſhort pyramid, conſiſting of ſix ſides as well as the column, is generally very pure and clear, though ſometimes blemiſhed, and the common ſize is about an inch and a half. It is naturally of a greyiſh white, very tranſparent, and pretty bright; however, it is ſometimes tinged with other colours. It is very ſoft, and found in the mines of Derbyſhire.

SPAR, with a very long pyramid, conſiſting of five ſides as well as the column, always adheres to ſome ſolid body, and is of a clear fine texture. It is ſeldom more than a quarter of an inch thick, and the third part of its length high. It appears very ſmooth and gloſſy, and looks like Cryſtal, though it is ſometimes tinged with other colours. It is pretty hard, and is found in Mendip hills.

Hard tranſparent SPAR, of the ſhape of a parallelopepid, commonly called Iceland Cryſtal, is extremely pure, clear and fine, and is found of various ſizes from a quarter of an inch to three inches in diameter; but its uſual ſize is two inches and a half. It ſeems to be ſmooth and even at firſt ſight, though if nicely examined ridges will be found upon it; it is almoſt as tranſparent as fine Cryſtal, but is very ſoft, and generally found ſingle. It is found in Iceland, as alſo in Germany and France; it conſiſts of plates laid one upon another, and will cleave in the manner of Talc; and when it is reduced to powder it ſtill retains its rhomboidal figure, which may be diſcovered by a microſcope. It has this ſingular property, that all objects appear double through it, which is owing to the double refraction of the rays of light.

Milk-White Opaque Shattery SPAR has a pretty fine and perfectly equal texture; but has no determinate ſhape, and is found from an inch to a foot in diameter, with a rough irregular ragged ſurface; it is ſometimes a little browniſh, and ſometimes inclining to a duſky red, and is pretty hard. It is found in France and Germany, and in ſome of the clifts of the Welch coaſts, as well as in Yorkſhire and Scotland.

Hard, Grey, Tranſparent SPAR, is of a pure equal texture, and has the appearance of Cryſtal, though it is ſometimes tinged with the colour of gems. It has uſually the figure of common flints with very uneven ſurfaces, and the ſize is from two inches to ſix or eight in diameter; it is frequently tinged with green, and ſometimes with yellow. It is pretty hard, and is found in the lead mines of Scotland, and in other places.

Tranſparent, Colourleſs, Shattery SPAR, is nearly like Cryſtal, and is of a pure, fine, regular texture; but it has no determinate figure, being found of various ſhapes and ſizes, that is, from half an inch to five inches in diameter; it is dark on the outſide, but when broken is extremely bright and gloſſy, and with a ſmall blow it will fall into many rhomboidal thick maſſes. It is not very hard, and is found in Hartz foreſt.

Naturaliſts divide Spar into innumerable other claſſes; but, after the Reader is well acquainted with ſuch as we have here mentioned, he will eaſily diſtinguiſh thoſe of an inferior ſort, without being burthened with a long account of them in print.

CHAP. XVII.

Of Cruſtated SPARS debaſed with Earth.

HARD, Semi-Tranſparent, Yelloviſh-Brown SPAR, has an equal regular texture, though not very fine, and the earth is regularly diffuſed throughout. It always conforms to the ſhape of the ſubſtance to which it is joined, and conſiſts of a thin cruſt extended over flat, round, and irregular ſurfaces. It is from the twentieth part, to the third part of an inch thick, and is from a few inches, to many feet in breadth. It is very ſoft, and is found in many parts of England.

Brittle, Tranſparent, Whitiſh SPAR, is of a pretty pure fine texture, though ſometimes tranſverſely ſtreaked with earth, rendering it red, yellow, brown or black; it is formed like a cruſt, and is ſometimes flat. It is found on the ſides of the perpendicular clefts of the mines in Germany, and the caverns of Mendip hills.

Hard, Whitiſh-Brown, Duſky SPAR, is foul and impure, though of a regular texture: it is extended over various bodies in the form of a cruſt, and is from an inch and a half broad to five or ſix feet. It is pretty hard, and is found in Hartz foreſt, as well as in the lead mines on Mendip hills.

Dull, Pale-Brown, Brittle, Coarſe SPAR, is the moſt common of all the cruſtaceous Spars, and is very coarſe, impure and earthy, being often tinged with various colours, by the different earths it is blended with. It is of no certain ſize, and it conforms to the ſhape of the maſs to which it gives a coat. It has a pretty even ſurface, the wrinkles being never deep; and, when broken, it is of an irregular texture. It will readily crumble between the fingers, and is found as well on the inſide of pipes for water, as in tea-kettles.

White, Light, Brittle, Earthy SPAR, is the coarſeſt of any of this kind, and the whole maſs is light, looſe and brittle; for ſome of this kind will not bear touching without crumbling to pieces. It has very luxuriant efflorescences on its ſurface, and more than any of theſe bodies. It is met with in various places.

Light, Hard, Pale-Brown, Earthy SPAR, with a ſmooth ſurface, often incruſts round moſs, for which reaſon ſome have taken it for petrified moſs. It is of an equal uniform ſtructure, but foul, and always aſſumes the ſhape of the body it is formed upon. It is pretty hard for an earthy Spar, and is found in all parts of the world.

Whitiſh, Brittle, Cruſtaceous Earthy SPAR, with a rough ſurface, is of a very coarſe, foul, impure texture, and of an earthy colour. It is always of the ſhape of the thing it incruſts, being ſometimes met with on ſmall ſtones, branches of moſs and the like. It is of a dull whitiſh colour, without the leaſt brightneſs, and is very ſoft and brittle. It is found in the ſubterraneous caves of various countries.

Hard, Pale-Brown, Thick, Rough, Earthy SPAR, which is the oſteocolla of the ſhops, is of a very coarſe, foul and impure texture, having the appearance of hardened marl. It is always found in long, thick, irregular, cylindrical pieces, uſually hollow, and ſometimes filled up with a ſofter ſubſtance. The ſurface is always rough and deeply wrinkled, being without the leaſt brightneſs. It is very hard, and is found in many parts of Germany. It has formerly been much eſteemed as a medicine, though it is now out of uſe.

Whitiſh-Grey, Brittle, Earthy SPAR, with a ſmooth ſurface, by ſome called the Foſſile Unicorn, and by others Stone Marl, is of a ſtony ſubſtance, and in colour, ſmoothneſs, and form, repreſents the horns, teeth or bones of animals; but ſometimes it is ſofter, with a hard yellowiſh, blackiſh, or aſh coloured

coloured cruſt, while it is ſoft and brittle in the inſide. This has an aſtringent taſte, and adheres firmly to the tongue. It is frequently dug up in pieces reſembling bones that are petrified; among which are the teeth called grinders and inciſors, which are extremely large, to which there is a root plainly connected. Sometimes they look like the fragments of bones of the arms and legs; and ſometimes they appear like the branches and trunks of trees turned into ſtone. They are found in various parts of Germany, as alſo in a hill near Paris, where they appeared to be real bones, covered over with a ſtony ſubſtance. It is commended by the Germans for being an aſtringent, promoting ſweat, and for ſtopping bleedings and looſeneſſes. It is given in the epilepſy from half a ſcruple to a drachm.

Whitiſh-Brown, Tuberoſe, Unequal SPAR, in the ſhape of coral, is of a pretty fine texture, and contains leſs earth than others of this kind. It is commonly in the ſhape of a ſmall oblong cylinder, with a pretty even ſurface, though it has often ſeveral branches like the coarſer white foſſile corals. It is about two inches and a half long, and the third of an inch in diameter; when broken, it is firm, ſolid and compact. It is found lodged in the ſtrata of yellow clay, and is very common in France and Germany; it is alſo met with near London.

Hard, White, Oblong, Conical SPAR, is extremely pure, and is as cryſtaline as any Spar whatever. It has the appearance of an icicle, broad at the baſe, and tapering towards the point; and its natural place is the arched roof of a ſubterraneous cavern. It is found from an inch to fifteen inches in length, and is ſometimes perfectly round. Theſe Spars are formed by water dropping from the roof of theſe caverns; and conſequently it is often met with in a petrified ſtate on the ground formed into various ſhapes; we have a remarkable inſtance of this in Pool's-Hole in Derbyſhire, which is conſidered as one of the wonders of the Peak.

There are alſo other Spars of various colours, which are found hanging to the roofs of caverns; but which, in reality, differ very little in their nature from the former.

CHAP. XVIII.
Of SALTS.

FOSSILE SALT, commonly called Sal-Gem, is of ſeveral kinds; it is almoſt as tranſparent as Cryſtal, and is ſometimes as white as ſnow, at others grey, red or yellow. When diſſolved in water and cryſtalized, by evaporating the moiſture, it becomes of a perfect cubical ſhape. It is called Sal-Gem, becauſe it has ſome reſemblance to ſtones of that kind; but it may be readily diſtinguiſhed from them, by applying it to the tongue. There are large rocks of this kind in different parts of the world, particularly in Spain near the river Ebro, and there is one of a purple colour in Portugal, and in Poland and Ruſſia there are ſeveral. It is pretended in Spain, that it grows as faſt as it is taken away; however, it is certain, the mine has been opened five hundred years. In Poland, ſix miles from Cracow, they hew the Salt out of the mountain, in the ſame manner as they do ſtone, in very large pieces. It has the ſame virtues as common Salt, and is uſed as well for clyſters as ſuppoſitories to evacuate the hard excrements. But this muſt never be uſed where there is an inflammation of the inteſtines.

Common SALT is either made with ſea-water, ſalt ſprings, or wells, by the heat of the ſun, or by boiling. In ſome places they dig pits near the ſea, and line them with clay; they afterwards fill them with ſea-water at high tides, and the water being exhaled by the heat of the ſun, there is left pleity of Salt at the bottom. In Neuſtria, that is, in the weſtern parts of France, they heap up the ſand on the ſea-ſhore, on which they pour ſea-water often, and after the moiſture has been exhaled by the heat of the ſun, the ſalt is left behind. When there is a ſufficient quantity, they boil it in freſh water, and then ſtrain it off into leaden veſſels, when they boil it again till it is become of a proper thickneſs; after which they remove the fire, and ſuffer it to coagulate into whitiſh cryſtals of Salt. They make Salt from ſalt ſprings much in the ſame manner, though there is a particular art in cauſing it to granulate; for ſome mix bullocks blood therewith, to cauſe a quicker ſeparation of the Salt from the bittern. This likewiſe frees it from the bituminous and earthy particles mixed with the Salt, which are either carried off in froth, or remain in the bottom of the pans. But that is the beſt Salt which is made with lakes of ſea-water, by the heat of the ſun, becauſe that which is made by fire has generally ſomewhat of bitterneſs. That made with the water of ſalt ſprings or wells is moſt pungent, on account of the alkalious mineral Salt mixed therewith; and is more apt to diſſolve than the former, even with a moiſt air; therefore, that made with ſea-water by the heat of the ſun is more fit for medicinal purpoſes, and is commonly called Bay Salt. This Salt alſo, when diſſolved and cryſtalized, is of a cubical form; but that made either with ſalt ſprings, or ſea-water, by the aſſiſtance of fire, cannot be brought into exact cubes, on account of its mixture with other Salts. Bay ſalt diſſolved in water, which being evaporated till a cuticle appears, will ſhoot to cubical cryſtals when cold; but that which is left, being of an alkaline nature, cannot be cryſtalized into any regular figure; however, there is a Salt made therewith, which is now generally known by the name of Epſom Salt. The ſpirit of Salt, when mixed with an alkaline Salt, as long as they will ferment together, will turn to common Salt, which in its taſte, and its cubical ſhape, reſembles Bay Salt; whence it appears, that ſea Salt is an acid perfectly ſaturated with an alkaline Salt. The uſe of ſea Salt is well known for its preventing fleſh from putrefaction; and therefore is neceſſary to hinder the fermentation of victuals, and their corruption; it likewiſe reſtrains the heat of the fluids in the body. Beſides, when volatile urinous ſalts are mixed with it, it turns into a Sal-Ammoniac, which is proper to temperate the ſharpneſs of the humours, and to cleanſe them by urine. People are in doubt whether it prevents or breeds ſtones in the kidneys, for many affirm, that the latter is true; but then it muſt be underſtood of meats that are rendered hard by being over ſalted. The ſpirit of Salt is proper to promote urine, to prevent the ſtone, to cure the dropſy, and to quench thirſt in burning fevers. It is excellent againſt the ſcurvy, and is given from three drops to twenty or upwards; or as much as will make any liquor agreeably acid. Dulcified ſpirit of Salt is given from fifteen to twenty drops every morning, in a decoction of juniper berries.

NATRUM, or NITRUM, of the ancients, is vaſtly different from the Nitre of the moderns. By old authors, it is ſaid to be an acrid Salt of an alkalious nature, brought from Egypt and other places, which would ferment with acid liquors, and was uſed for waſhing of cloaths and for making glaſs. Natrum is now found in Leſſer-Aſia, in little hillocks, like mole-hills, in the ſpring and ſummer, of which they make a lye for waſhing their linen. It is at preſent ſeldom ſeen in Europe, though it was of frequent uſe with the ancients, not only for medicine, but various other purpoſes. The natrum of the ancients was a native Salt of a whitiſh colour and a bitteriſh taſte, which did not crackle in the fire